

A Scanning Electron Microscope
Survey of the Epidermis
of East African Grasses, III

*Patricia G. Palmer, Susan Gerbeth-Jones,
and Susan Hutchison*



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ABSTRACT

Palmer, Patricia G., Susan Gerbeth-Jones, and Susan Hutchison. A Scanning Electron Microscope Survey of the Epidermis of East African Grasses, III. *Smithsonian Contributions to Botany*, number 55, 136 pages, 98 plates, 1985.—In developing a reference collection as a standard for using fossil grass cuticles as a paleoecological tool, we have examined leaf epidermal features of grasses with SEM. Descriptions (abaxial and adaxial surfaces) of 49 East African species are presented that represent seven tribes: Aristideae, Pappophoreae, Eragrostideae, Chlorideae, Sporoboleae, Leptureae, Zoyseae.

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A Scanning Electron Microscope Survey of the Epidermis of East African Grasses, III

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Introduction

This paper represents the third part of a survey of East African grasses. The purpose of this survey is to develop a reference collection of the microanatomical features of the leaves of modern grasses. The reference collection will provide a standard of comparison for identifying fossil leaf fragments that are abundant in East African lake sediments (Palmer, 1976). As in the first two volumes of this survey (Palmer and Tucker, 1981, 1983), we are examining the grass leaves with scanning electron microscopy (SEM). The reader should refer to the first volume (Palmer and Tucker, 1981) for discussion of terminology and illustrations of diagnostic features. In this present study, we encountered a type of epidermal hair not described in our terminology section in Volume I (Palmer and Tucker, 1981). Careful study with SEM has shown that these unique hairs occurring in the Pappophoreae are "modified microhairs" (see Plate 5).

Patricia G. Palmer, Department of Biology, Louisburg College, Louisburg, North Carolina 27549. Susan Gerbeth-Jones, Department of Zoology, Duke University, Durham, North Carolina 27706. Susan Hutchison, 9528 N.E. 120th St. No. C3, Kirkland, Washington 98033.

This volume includes 49 species representing 7 tribes: Aristideae, Pappophoreae, Eragrostideae, Chlorideae, Sporoboleae, Leptureae, Zoyisaeae.

We delimit East Africa to include Uganda, Kenya, and Tanzania, the region dealt with in the *Flora of Tropical East Africa, Gramineae* by Clayton (1970, 1974, 1982). We also follow the nomenclature of the *Flora of Tropical East Africa*.

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MATERIALS AND METHODS.—Leaf material for scanning electron microscopy was taken from dried herbarium material. A section from the

middle portion of a blade from an upper, mature, undamaged leaf was chosen for study. Wax was removed by soaking the specimen in xylene for 24 hours. Two pieces of the leaf (one exposing the abaxial or lower surface, the other exposing the adaxial or upper surface) were mounted on stubs with double-coated Scotch tape. The specimens were sputter-coated with gold-palladium, observed with a JEOL T20 or a Philips 501 scanning electron microscope, and photographed using Polaroid P/N 665 or P/N 55 film. Occasionally, specimens were examined by energy dispersive X-ray analysis using the EDAX 9100/60 to clarify certain anatomical features. The photomicrographs are deposited in the laboratory of D.A. Livingstone, Department of Zoology, Duke University.

Format for Species Descriptions

STOMATA.—Frequency; subsidiary cell shape; distribution; special features.

INTERSTOMATAL CELLS.—Shape; end walls; outline of walls. *Papillae*: Number/cell, distribution on each cell, shape, size.

LONG CELLS.—Shape; outline of walls. *Papillae*: Number/cell, distribution on each cell, shape, size.

PRICKLES.—Frequency; location and type.

SHORT CELLS.—Location and distribution. *Silica Cells*: Location and frequency. *Cork Cells*: Location and frequency.

SILICA BODIES.—Location and shape.

MICROHAIRS.—Frequency; number of cells; shape; shape of apex.

MACROHAIRS.—Frequency; location; nature of base.

SPECIAL FEATURES.—Description of unique features not covered in other categories.

Tribe ARISTIDEAE

Aristida scabrivalvis Hackel

PLATES 1-2

ABAXIAL

STOMATA.—Common; triangular to high-dome; 2 stomatal bands/intercostal zone, 1 or

sometimes 2 rows/band (Plate 1*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 1*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 1*d,f*).

PRICKLES.—Abundant; costal prickles and short macrohairs (Plate 1*a,d*).

SHORT CELLS.—Costal paired, 3-5/row, or >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 1*e*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, long and short; intercostal not seen (Plate 1*e*).

MICROHAIRS.—Infrequent (marginal only); two-celled; basal longer, apical shorter; apex rounded (?) (Plate 1*f*).

MACROHAIRS.—See Prickles.

ADAXIAL

STOMATA.—Abundant; low-dome to triangular; 1 or sometimes 2 stomatal bands/intercostal zone; 1 row/band. Subsidiary cells papillate (Plate 2*b,c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 2*c,d*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 2*c,d*).

PRICKLES.—Abundant; costal prickles (Plate 2*a,c*).

SHORT CELLS.—Costal 3-5/row or >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 2*c-e*).

SILICA BODIES.—Costal saddle-shaped (major veins only) or dumbbell; ends rounded or sometimes straight, middle wide, short; intercostal not seen. Silica bodies on major veins are raised (Plate 2*a,d,e*).

MICROHAIRS.—Abundant; two-celled; basal

shorter, apical longer; apex rounded (Plate 2*f*).
 MACROHAIRS.—None seen.

***Stipagrostis uniplumis* (Lichtenstein) de
 Winter**

PLATES 3-4

ABAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2, 3 rows/band (Plate 3*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 3*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 3*b,c,f*).

PRICKLES.—Abundant; costal prickles (Plate 3*d*).

SHORT CELLS.—Costal solitary, paired, 3-5/row, or >5/row; intercostal solitary (cork cells only), paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 3*b,d,e*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal cross-shaped (Plate 3*d,e*).

MICROHAIRS.—Common, two-celled; basal slightly shorter, apical longer to basal and apical equal in length, medium; apex rounded (Plate 3*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular; 2 or 6 stomatal bands/intercostal zone; 1 or sometimes 2 rows/band (Plate 4*b,d*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Nature of interstomatal cells in nonmarginal areas indeterminable because of collapsed cells (Plate 4*b,d*).

LONG CELLS.—Rectangular to long, narrow,

width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen. Nature of long cells in nonmarginal areas indeterminable because of collapsed cells (Plate 4*b,d*).

PRICKLES.—Abundant; costal and intercostal prickles (Plate 4*a,d*).

SHORT CELLS.—Costal solitary, paired, 3-5/row, or >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 4*b,c*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 4*c*).

MICROHAIRS.—Infrequent (marginal only); two-celled; basal and apical equal in length, medium; apex rounded (Plate 4*e*).

MACROHAIRS.—Infrequent; intercostal; basal cells slightly to markedly raised. Shaft twisted giving the appearance of a double-helix (Plate 4*d,f*).

Tribe PAPPOPHOREAE

***Enneapogon cenchroides* (Roemer and
 Schultes) C.E. Hubbard**

PLATES 5-6

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 5*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly to markedly concave; slightly sinuous. *Papillae*: None seen (Plate 5*b,c*).

LONG CELLS.—Long, narrow, width uniform; slightly sinuous. *Papillae*: None seen (Plate 5*a,c*).

PRICKLES.—Common; costal and occasionally intercostal prickles (Plate 5*a,c,d*).

SHORT CELLS.—Costal 3-5/row, >5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 5*d*).

SILICA BODIES.—Costal dumbbell, ends concave to straight, middle wide, short or occasionally wide, long; intercostal not seen (Plate 5*d*).

MICROHAIRS.—Common; two-celled; basal much longer, apical shorter; apex rounded. Apical cell often deflated. The microhair is a modified type that is unusually long, approaching the length of a macrohair, because of the very long basal cell, and has a bulbous apical cell. Basal cells usually markedly raised on one side (Plate 5*e,f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular or sometimes low-dome; 2 stomatal bands/intercostal zone, 1 row/band (Plate 6*b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 6*a,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 6*a,d*).

PRICKLES.—Abundant; costal short macrohairs; intercostal hooks (Plate 6*a,d*).

SHORT CELLS.—Costal solitary, paired; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal infrequent; intercostal not seen (Plate 6*d*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, long and short; intercostal not seen (Plate 6*d*).

MICROHAIRS.—Common; two-celled; basal much longer, apical shorter; apex rounded. Apical cell often deflated. The microhair is a modified type that is unusually long, approaching the length of a macrohair, because of the very long basal cell, and has a bulbous apical cell. Basal cells markedly raised on one side (Plate 6*e,f*).

MACROHAIRS.—None seen.

Schmidtia pappophoroides J.A. Schmidt

PLATES 7-8

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 7*b,c*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 7*b*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 7*b,e*).

PRICKLES.—Infrequent to common; costal and intercostal prickles. Prickles appear laterally compressed (Plate 7*b,c*).

SHORT CELLS.—Costal paired, 3-5/row, >5/row; intercostal paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 7*c-e*).

SILICA BODIES.—Costal cross-shaped, dumbbell, ends straight or sometimes lobed, middle wide, short; intercostal dumbbell, ends straight or sometimes lobed, middle wide, short (Plate 7*b-d*).

MICROHAIRS.—Common; two-celled; basal much longer, apical shorter; apex rounded. Apical cell often deflated. The microhair is a modified type that is unusually long, approaching the length of a macrohair, because of the very long basal cell and has a bulbous apical cell (Plate 7*d,e*).

MACROHAIRS.—Common; intercostal; basal cells slightly raised. Shaft of macrohairs sometimes twisted (Plate 7*a,f*).

ADAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 8*b*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 8*b*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 8*b,c*).

PRICKLES.—Infrequent; costal and intercostal prickles (Plate 8*c,e*).

SHORT CELLS.—Costal paired, 3-5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal

abundant; intercostal not seen (Plate 8*d,e*).

SILICA BODIES.—Costal dumbbell, ends rounded, straight or sometimes lobed, middle wide, short; intercostal not seen (Plate 8*d,e*).

MICROHAIRS.—Common; two-celled; basal much longer, apical shorter; apex rounded. Apical cell often deflated. The microhair is a modified type that is unusually long, approaching the length of a macrohair, because of the very long basal cell, and has a bulbous apical cell (Plate 8*b,e*).

MACROHAIRS.—Infrequent to common; intercostal; basal cells markedly raised (Plate 8*a,f*).

Tribe ERAGROSTIDAE

Acrachne racemosa (Roemer and Schultes) Ohwi

PLATES 9–10

ABAXIAL

STOMATA.—Common; triangular but often collapsed and appearing low-dome; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 9*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; slightly sinuous. *Papillae*: None seen (Plate 9*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; slightly sinuous. *Papillae*: None seen (Plate 9*c*).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5 /row; intercostal solitary (silica cells only). *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal not seen (Plate 9*c-e*).

SILICA BODIES.—Costal saddle-shaped or sometimes dumbbell, ends straight, middle wide, short, or nodular; intercostal nodular (Plate 9*c-e*).

MICROHAIRS.—Abundant; two-celled; basal and apical equal in length, short; apex rounded (Plate 9*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular or sometimes low-dome; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 10*b,c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; outline of walls indeterminable because of collapsed cells. *Papillae*: None seen (Plate 10*c*).

LONG CELLS.—Long, narrow, width uniform; outline of walls indeterminable because of collapsed cells. *Papillae*: None seen. Raised rectangular cells present in mid-intercostal region (Plate 10*a,c*).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5 /row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 10*d,e*).

SILICA BODIES.—Costal saddle-shaped or sometimes dumbbell, ends rounded, middle wide, short. Saddle-shaped silica bodies often have a single lateral knob on one or both sides (Plate 10*d,e*).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short; apex rounded (?), usually collapsed (Plate 10*f*).

MACROHAIRS.—None seen.

Apochiton burttii C.E. Hubbard

PLATES 11–12

ABAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 11*b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 11*a-c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 11*a,d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal solitary, paired, 3–5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 11*d,e*).

SILICA BODIES.—Costal cross-shaped, dumbbell, ends concave to straight, middle wide, short or sometimes narrowly saddle-shaped; intercostal not seen (Plate 11*d,e*).

MICROHAIRS.—Infrequent to common; two-celled; basal and apical equal in length, short to basal longer, apical shorter; apex rounded (Plate 11*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 1 or sometimes 2 stomatal bands/intercostal zone, 1 row/band (Plate 12*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None or 1 near end, globose, uniform. Cells sometimes raised near one end. Cells often collapsed forming a mid-longitudinal ridge along the cell (Plate 12*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or 1 near end, globose, uniform. Cells often deflated forming mid-longitudinal ridge along cell (Plate 12*c*).

PRICKLES.—Common to abundant; costal and intercostal prickles (Plate 12*c*).

SHORT CELLS.—Costal solitary (?), paired, 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 12*d,e*).

SILICA BODIES.—Costal cross-shaped, dumbbell, ends concave to straight, middle wide, short, or sometimes widely saddle-shaped; intercostal not seen (Plate 12*d,e*).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short or basal longer, apical shorter; apex rounded (Plate 12*f*).

MACROHAIRS.—None seen.

Bewsia biflora (Hackel) Goosens

PLATES 13–14

ABAXIAL

STOMATA.—Common; low-dome; 1 stomatal band/intercostal zone, 1 row/band. Intercostal zone very narrow and grooved. Stomata difficult to detect (Plate 13*a–c*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 13*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised (?). *Papillae*: None seen (Plate 13*e*).

PRICKLES.—Abundant; costal prickles (Plate 13*d*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary or paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 13*d–f*).

SILICA BODIES.—Costal dumbbell; intercostal cross-shaped, dumbbell, ends concave to straight, middle long, narrow or short, wide (Plate 13*d–f*).

MICROHAIRS.—None seen.

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; low-dome; 2 stomatal bands/intercostal zone, 2 rows/band (Plate 14*b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; outline of walls not discernable because of wax. *Papillae*: 3 or more/cell, single row or irregular, globose, uniform (Plate 14*c*).

LONG CELLS.—Long, narrow, width uniform; outline of walls indeterminable because of wax. *Papillae*: 3 or more/cell, single row or irregular, globose, uniform (Plate 14*c*).

PRICKLES.—Common; costal prickles (Plate 14*d*).

SHORT CELLS.—Costal >5 /row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 14*d,e*).

SILICA BODIES.—Costal dumbbell, ends rounded to straight, middle wide, short; intercostal not seen (Plate 14*d,e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex tapered. Microhairs located on veins (Plate 14*f*).

MACROHAIRS.—Infrequent; intercostal; basal cells markedly raised (Plate 14*a*).

Coelachyrum longiglume Napper

PLATES 15–16

ABAXIAL

STOMATA.—Common; low-dome; distribution indeterminable because intercostal zone not clearly defined (Plate 15*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell or sometimes none or sometimes end of cell slightly raised, globose, variable. Papilla located near one end of cell (Plate 15*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, sometimes none or sometimes end of cell slightly raised, globose, variable. Papilla located near one end of cell (Plate 15*c*).

PRICKLES.—Infrequent; costal prickles (Plate 15*a*).

SHORT CELLS.—Costal >5 /row; intercostal solitary or paired. *Silica Cells*: Costal and intercostal infrequent. *Cork Cells*: Costal and intercostal infrequent (Plate 15*d,e*).

SILICA BODIES.—Costal cross-shaped, dumbbell, ends straight, middle wide, short; intercostal cross-shaped (Plate 15*d,e*).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short; apex rounded. Mainly in marginal area (Plate 15*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1–3 rows/band (Plate 16*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; nonsinuous. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 16*c*).

LONG CELLS.—Long, narrow, width uniform; nonsinuous to slightly sinuous. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell, often deflated (Plate 16*d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5 /row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 16*e*).

SILICA BODIES.—Costal saddle-shaped to cross-shaped; intercostal not seen (Plate 16*e*).

MICROHAIRS.—Common to abundant; two-celled; basal and apical equal in length, short; apex rounded (Plate 16*f*).

MACROHAIRS.—None seen.

Cypholepis yemenica (Schweinfurth)

Chiovenda

PLATES 17–18

ABAXIAL

STOMATA.—Abundant; low-dome; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 17*b,c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None or sometimes 1/cell, globose, uniform. Papilla located near one end of cell (Plate 17*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1 or sometimes none/cell, globose, uniform. Papilla located near one end of cell (Plate 17*d*).

PRICKLES.—Infrequent; costal prickles (Plate 17*e*).

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only), paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal common (Plate 17a, d, e).

SILICA BODIES.—Costal saddle-shaped, cross-shaped; intercostal saddle-shaped (Plate 17a, d, f).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Basal and apical cells often deflated (Plate 17f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome to high-dome; 2 stomatal bands/intercostal zone, 1 row/band (Plate 18b, c).

INTERSTOMATAL CELLS.—Rectangular; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cells often deflated (Plate 18c, e).

LONG CELLS.—Rectangular to long, narrow, width uniform; outline of walls indeterminable. *Papillae*: None seen. Cells often deflated (Plate 18c, e).

PRICKLES.—Common; costal prickles (Plate 18a, d).

SHORT CELLS.—Costal >5/row, 3–5/row, paired; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 18d).

SILICA BODIES.—Costal widely saddle-shaped, cross-shaped, nodular, dumbbell, ends straight, middle wide, short. Saddle-shaped silica bodies have lateral knobs (Plate 18d, e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Basal and apical cells usually deflated (Plate 18f).

MACROHAIRS.—None seen.

Dactyloctenium giganteum Fisher and Schweickerdt

PLATES 19–20

ABAXIAL

STOMATA.—Abundant; low-dome or sometimes triangular; 2 or sometimes 4 bands/inter-

costal zone, 1 or sometimes 2 rows/band (Plate 19a, b, d).

INTERSTOMATAL CELLS.—Rectangular or sometimes pentagonal; ends slightly concave; outline of walls not discernable because of collapsed cells. *Papillae*: 1/cell, globose, uniform. *Papillae* usually deflated (Plate 19c).

LONG CELLS.—Rectangular or sometimes pentagonal; outline of walls not discernable because of collapsed cells. *Papillae*: Usually 1/cell, globose, uniform. *Papillae* usually deflated (Plate 19d).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 19c, e).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 19e, f).

MICROHAIRS.—Abundant; one-celled. Walls of collapsed, adjacent, long cells form a circular ridge at the base (Plate 19f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Infrequent; triangular; distribution indeterminable. Stomata seen only near mid-vein, possibly others sunken in grooves (Plate 20b, c).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cells often deflated (Plate 20c).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cells often deflated (Plate 20c, d).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 20a, d, e).

SILICA BODIES.—Costal saddle-shaped, sometimes with lateral knobs; intercostal not seen (Plate 20e).

MICROHAIRS.—Common; one-celled. Walls of

collapsed, adjacent, long cells form a circular ridge at the base (Plate 20f).

MACROHAIRS.—None seen.

Dinebra retroflexa (Vahl) Panzer

PLATES 21–22

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band. Single papilla (often deflated) on each subsidiary cell (Plate 21a,b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly to markedly concave; slightly sinuous. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 21c).

LONG CELLS.—Long, narrow, width uniform or sometimes rectangular; slightly sinuous. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 21a,c).

PRICKLES.—Abundant; costal prickles and intercostal hooks (Plate 21d).

SHORT CELLS.—Costal >5 /row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent. Cork cells papillate (Plate 21c,e).

SILICA BODIES.—Costal dumbbell, ends rounded, middle wide, short; intercostal not seen (Plate 21e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Apical cell usually deflated (Plate 21f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band. Single papilla (often deflated) on each subsidiary cell (Plate 22a,b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; slightly sinuous. *Papillae*: 1/cell, globose,

uniform. Papilla located near one end of cell (Plate 22c).

LONG CELLS.—Long, narrow, width uniform; slightly sinuous. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 22a,d).

PRICKLES.—Common; costal prickles and intercostal hooks (Plate 22d,e).

SHORT CELLS.—Costal >5 /row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 22e).

SILICA BODIES.—Costal dumbbell, ends rounded or sometimes with knob on end, middle wide, short; intercostal not seen (Plate 22e).

MICROHAIRS.—Common to abundant; two-celled; basal longer, apical shorter; apex rounded (Plate 22f).

MACROHAIRS.—None seen.

Diplachne fusca (Linnaeus) Stapf

PLATES 23–24

ABAXIAL

STOMATA.—Common to abundant; low-dome or sometimes triangular; 2 stomatal bands/intercostal zone, 1 row/band. Intercostal zone very narrow (Plate 23b,c).

INTERSTOMATAL CELLS.—Square to sometimes rectangular; straight to convex; outline of walls not discernable. *Papillae*: 1/cell, elongate, uniform (Plate 23b,c).

LONG CELLS.—Rectangular; outline of walls not discernable. *Papillae*: 1/cell, elongate, uniform (Plate 23c,e).

PRICKLES.—Common; costal prickles (Plate 23d).

SHORT CELLS.—Costal >5 /row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen. Cork cells usually papillate (Plate 23a,e).

SILICA BODIES.—Costal saddle-shaped or sometimes cross-shaped; intercostal not seen (Plate 23c,e).

MICROHAIRS.—Common; two-celled; basal

longer, apical shorter; apex rounded (Plate 23*f*).
MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular to high-dome; 2 or sometimes 1 stomatal band/intercostal zone, 1 or 2 rows/band (Plate 24*a,b*).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; outline of walls not discernable. *Papillae*: 1/cell, elongate, uniform. Papilla located near one end of cell (Plate 24*b*).

LONG CELLS.—Rectangular; outline of walls not discernable. *Papillae*: 1/cell, elongate, uniform. Papilla located near one end of cell (Plate 24*c*).

PRICKLES.—Common; costal prickles (Plate 24*c*).

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal common. Cork cells papillate (Plate 24*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 24*d,e*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded (Plate 24*f*).

MACROHAIRS.—None seen.

***Drake-Brockmania haareri* (Stapf and Hubbard) S.M. Phillips**

PLATES 25–26

ABAXIAL

STOMATA.—None seen. Intercostal zone narrow, grooved, overarched by papillae (Plate 25*a–c*).

LONG CELLS.—Rectangular or occasionally long, narrow, width uniform; markedly sinuous, interlocking, raised (?). *Papillae*: 1/cell, elongate, uniform (Plate 25*b,d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal and

intercostal abundant. Cork cells papillate (Plate 25*c–e*).

SILICA BODIES.—Costal dumbbell, ends straight, sometimes rounded or occasionally lobed, middle wide, short; intercostal not seen (Plate 25*e*).

MICROHAIRS.—None seen. May be obscured in grooves or by papillae.

MACROHAIRS.—Common; intercostal; basal cells markedly raised (Plate 25*a,f*).

ADAXIAL

STOMATA.—None seen.

LONG CELLS.—Rectangular to long, narrow, width uniform; slightly sinuous or often appearing nonsinuous because of collapsed cells. *Papillae*: 1/cell, globose to elongate, uniform. Usually collapsed perhaps because thin-walled (Plate 26*b*).

PRICKLES.—Common; costal prickles (Plate 26*c*).

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent to common. Cork cells papillate (Plate 26*d*).

SILICA BODIES.—Costal dumbbell, ends rounded or sometimes lobed, middle wide, short; intercostal not seen (Plate 26*d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded (?). Apical cell usually deflated (Plate 26*e*).

MACROHAIRS.—Common; intercostal; basal cells markedly raised (Plate 26*a,f*).

***Eleusine floccifolia* (Forskål) Sprengel**

PLATES 27–28

ABAXIAL

STOMATA.—Abundant; triangular; 1 stomatal band/intercostal zone, 1 or sometimes 2 rows/band (Plate 27*a,b*).

INTERSTOMATAL CELLS.—Rectangular to

long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. There are sometimes two interstomatal cells between stomata (Plate 27*c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 27*c,d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal solitary, paired; intercostal solitary (cork cells only). *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal and intercostal common (Plate 27*c-e*).

SILICA BODIES.—Costal tall and narrow to saddle-shaped; intercostal not seen (Plate 27*d*).

MICROHAIRS.—Common; one-celled. Microhairs usually collapsed (Plate 27*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 row/band. Subsidiary cells usually collapsed (Plate 28*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex, slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cells often raised on one end appearing papillate or sometimes collapsed. There are sometimes two interstomatal cells between stomata (Plate 28*c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen or one near end of cell. Outline of walls in intercostal area indeterminate because of collapsed cells (Plate 28*a,c,d*).

PRICKLES.—Infrequent; intercostal prickles (Plate 28*e*).

SHORT CELLS.—Costal solitary (cork cells only), >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 28*d,e*).

SILICA BODIES.—Costal nodular, saddle-shaped with lateral knobs, dumbbell, ends concave or lobed, middle narrow, long to short; intercostal not seen (Plate 28*d*).

MICROHAIRS.—Common; one-celled. Microhairs often collapsed (Plate 28*f*).

MACROHAIRS.—None seen.

Eragrostiella bifaria (Vahl) Bor

PLATES 29–30

ABAXIAL

STOMATA.—None seen. Intercostal zone very narrow, grooved. Not possible to determine if stomata present (Plate 29*a,b*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 29*b,c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 29*a,b,d*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 29*d,e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 29*c,f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 30*a-c*).

INTERSTOMATAL CELLS.—Square to rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, irregular, globose, uniform (Plate 30*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, uniform. In mid-intercostal region, nonpapillate long cells appear fused and form a single or double ridge (Plate 30*a,c,d*).

PRICKLES.—Common; costal or sometimes intercostal prickles (Plate 30*f*).

SHORT CELLS.—Costal >5/row; intercostal not

seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 30*d*).

SILICA BODIES.—Costal narrowly saddle-shaped; intercostal not seen (Plate 30*d*).

MICROHAIRS.—Abundant; two-celled; basal and apical equal in length, short; apex rounded (Plate 30*e*).

MACROHAIRS.—Common (abundant near margin); intercostal; basal cells markedly raised. Located on mid-intercostal ridge (Plate 30*f*).

***Eragrostis macilentia* (A. Richard) Steudel**

PLATES 31–32

ABAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 31*a,b*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 31*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen. The long cell adjacent to stoma often has a raised area opposite the stoma (Plate 31*c,d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common (Plate 31*d,e*).

SILICA BODIES.—Costal saddle-shaped or sometimes cross-shaped or dumbbell, ends concave, middle wide, short; intercostal not seen (Plate 31*e*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded (Plate 31*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 32*b,c*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 32*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen. The long cell adjacent to stoma often has a raised area opposite the stoma (Plate 32*a,c,d*).

PRICKLES.—Common; costal and intercostal prickles (Plate 32*d*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal solitary (mainly marginal). *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 32*d,e*).

SILICA BODIES.—Costal cross-shaped or dumbbell, ends concave or straight, middle wide, short or sometimes saddle-shaped; intercostal cross-shaped (Plate 32*d,e*).

MICROHAIRS.—Infrequent to common; two-celled; basal longer, apical shorter; apex rounded (Plate 32*f*).

MACROHAIRS.—None seen.

***Halopyrum mucronatum* (Linnaeus) Stapf**

PLATES 33–34

ABAXIAL

STOMATA.—Stomata obscured in grooves and by overarching papillae, features not discernable (Plate 33*a–c*).

LONG CELLS.—Long, narrow, width uniform; nonsinuous. *Papillae*: None seen (Plate 33*d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal and intercostal solitary. *Silica Cells*: Costal and intercostal common. *Cork Cells*: Costal and intercostal common. Difficult to distinguish silica cells from cork cells and costal regions from intercostal (Plate 33*e, f*).

SILICA BODIES.—Costal and intercostal square to saddle-shaped (Plate 33*e, f*).

MICROHAIRS.—None seen. May be obscured in grooves (Plate 33*c*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; low-dome to triangular; distribution indeterminable because stomata often obscured in grooves and overarched by papillae (Plate 34a-c).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; nonsinuous (?). *Papillae*: 1/cell, globose to elongate, uniform (Plate 34b).

LONG CELLS.—Rectangular, long, narrow, width uniform; nonsinuous (?). *Papillae*: 1/cell, globose to elongate, uniform (Plate 34c).

PRICKLES.—Abundant; costal prickles and short macrohairs (Plate 34d).

SHORT CELLS.—Costal and intercostal solitary. *Silica Cells*: Costal and intercostal common. *Cork Cells*: Costal and intercostal common. Cork cells papillate (Plate 34e, f).

SILICA BODIES.—Costal and intercostal square to saddle-shaped (Plate 34e, f).

MICROHAIRS.—None seen. Perhaps obscured by papillae (Plate 34c).

MACROHAIRS.—See Prickles.

***Harpachne schimperi* A. Richard**

PLATES 35-36

ABAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 35a,b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends markedly or sometimes slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 35c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 35c).

PRICKLES.—Common; costal prickles (Plate 35d).

SHORT CELLS.—Costal paired or sometimes solitary, 3-5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 35e).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 35e).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, medium; apex rounded. Basal cell tapered to base (Plate 35f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 36a,b).

INTERSTOMATAL CELLS.—Square to rectangular; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 36b,c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 36b,c).

PRICKLES.—Common to abundant; costal prickles (Plate 36d).

SHORT CELLS.—Costal 3-5/row or sometimes paired, solitary (cork cells only); intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 36d,e).

SILICA BODIES.—Costal saddle-shaped, cross-shaped, dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 36d,e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Basal cell tapered at base (Plate 36f).

MACROHAIRS.—None seen.

***Leptocarydion vulpiastrum* (De Notaris) Stapf**

PLATES 37-38

ABAXIAL

STOMATA.—Abundant; low-dome; 1 or sometimes 2 stomatal bands/intercostal zone; 1 to 2 rows/band (Plate 37a,b,d).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1 to 2/cell, globose, variable. Occasionally there are 2 interstomatal cells between stomata (Plate 37c,d).

LONG CELLS.—Square to rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1, 2, or 3 or more/cell, single row, globose, variable (Plate 37*b,c*).

PRICKLES.—Common; costal or sometimes intercostal prickles (Plate 37*a,e*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common (Plate 37*d,e*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 37*d,e*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Apical cell usually deflated (Plate 37*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome or sometimes triangular; 2 stomatal bands/intercostal zone; 1 or sometimes 2 rows/band (Plate 38*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1 to 2/cell, globose, variable (Plate 38*c,d*).

LONG CELLS.—Rectangular; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, variable. Mid-intercostal cells are collapsed forming a distinct band (Plate 38*a,c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only), paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 38*d,e*).

SILICA BODIES.—Costal dumbbell, ends straight or sometimes rounded; middle wide, short; intercostal cross-shaped (Plate 38*e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Usually located on veins (Plate 38*f*).

MACROHAIRS.—None seen.

Leptochloa obtusiflora Hochstetter

PLATES 39–40

ABAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 39*b*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 39*b*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or sometimes 1/cell, globose, uniform. Papilla located near one end of cell (Plate 39*c*).

PRICKLES.—Common; costal prickles (Plate 39*b,c,e*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 39*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 39*a,d,e*).

MICROHAIRS.—Common to abundant; two-celled; basal longer, apical shorter; apex rounded. Microhairs located on vein or immediately adjacent to vein (Plate 39*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common (?); low-dome to triangular; 2 (?) stomatal bands/intercostal zone, 1 (?) row/band. Stomata sunken in grooves and obscure except near margin. Intercostal zones very narrow (Plate 40*a–c*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave, markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 40*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell or sometimes none, globose, uniform. Papilla located near one end of cell (Plate 40*c,d*).

PRICKLES.—Common to abundant; costal prickles (Plate 40*d,e*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary (usually cork cell), paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 40*c,e,f*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 40*c,e,f*).

MICROHAIRS.—None seen.

MACROHAIRS.—None seen.

Lintonia nutans Stapf

PLATES 41–42

ABAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 41*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 41*c*).

LONG CELLS.—Rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 41*c,d*).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common (Plate 41*d,e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 41*d,e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length (?), short; apex rounded (?); apical cell usually deflated (Plate 41*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common to abundant; triangular to high-dome; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 42*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: None or 1/cell, globose, uniform. Papilla when present near one end of cell (Plate 42*c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or 1/cell, globose, uniform. Long cells often very wide especially in mid-intercostal zone (Plate 42*a,d*).

PRICKLES.—Common; costal and intercostal prickles (Plate 42*d*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 42*c–e*).

SILICA BODIES.—Costal saddle-shaped, sometimes with a single lateral knob on each side; intercostal not seen (Plate 42*d,e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 42*f*).

MACROHAIRS.—None seen.

Odyssea paucinervis (Nees) Stapf

PLATES 43–44

ABAXIAL

STOMATA.—Frequency, subsidiary cell shape, and distribution indeterminable because of abundance of overarching papillae (Plate 43*a,b*).

LONG CELLS.—Square to rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1/cell (?), globose, uniform (Plate 43*c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal infrequent. Intercostal cork cells papillate (Plate 43*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 43*d,e*).

MICROHAIRS.—None seen. May be difficult to distinguish from papillae.

MACROHAIRS.—Common to abundant; intercostal; basal cells markedly raised, raised more on one side than the other (Plate 43*f*).

ADAXIAL

STOMATA.—Common; low-dome to triangular (?); distribution indeterminable because of over-arching papillae (Plate 44*b,c*).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 44*b,c*).

LONG CELLS.—Square to rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 44*d*).

PRICKLES.—Common; costal prickles (Plate 44*f*).

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal common. Cork cells often papillate (Plate 44*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 44*e*).

MICROHAIRS.—None seen. May be difficult to distinguish from papillae.

MACROHAIRS.—Common; intercostal; basal cells absent (Plate 44*a, f*).

Pogonarthria squarrosa (Roemer and Schultes) Pilger

PLATES 45–46

ABAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band. Intercostal zone very narrow and grooved with stomata on sides of groove (Plate 45*a,b*).

INTERSTOMATAL CELLS.—Rectangular to

long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 45*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 45*c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal solitary, paired, 3–5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal and intercostal common (Plate 45*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 45*d,e*).

MICROHAIRS.—Abundant; two-celled; basal and apical equal in length, medium; apex rounded. Microhairs occur in intercostal groove. Basal cell tapered to base (Plate 45*c, f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 46*a–c*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cell has a ridged and folded appearance with edges adjacent to stoma raised (Plate 46*b,c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 46*c,d*).

PRICKLES.—Common; costal prickles (Plate 46*d*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 46*c–e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 46*c–e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, medium; apex rounded (Plate 46*f*).

MACROHAIRS.—None seen.

***Pogoneura biflora* Napper**

PLATES 47-48

ABAXIAL

STOMATA.—Common; low-dome; 2 stomatal bands/intercostal zone, 1 or 2 rows/band. Intercostal zone fairly narrow (Plate 47*b,c*).

INTERSTOMATAL CELLS.—Rectangular or sometimes square or long, narrow, width uniform; ends markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 47*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or sometimes a hint of single row, globose, uniform (Plate 47*b-d*).

PRICKLES.—Infrequent; marginal only. Large, straight, stiff prickles or short macrohairs (Plate 47*f*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen. Cork cells papillate (Plate 47*d*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 47*a,d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Microhair tapered to base (Plate 47*e*).

MACROHAIRS.—See Prickles.

ADAXIAL

STOMATA.—Abundant; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 48*b,c*).

INTERSTOMATAL CELLS.—Square, rectangular; ends slightly concave; slightly sinuous. *Papillae*: 2, 3, or more/cell, single row, pairs, irregular, globose, uniform (Plate 48*c,d*).

LONG CELLS.—Long, narrow, width uniform; slightly sinuous. *Papillae*: 3 or more/cell, single row, globose, uniform (Plate 48*c,d*).

PRICKLES.—Common; costal prickles, marginal large, straight, stiff prickles or short macrohairs (Plate 48*a,d*, Plate 47*f*).

SHORT CELLS.—Costal >5/row; intercostal solitary (*silica cells* only). *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal not seen. Some cork cells papillate (Plate 48*c-e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 48*c-e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Microhairs tapered at base, often located on or adjacent to veins (Plate 48*e,f*).

MACROHAIRS.—See Prickles.

***Psilolemma jaegeri* (Pilger) S.M. Phillips**

PLATES 49-50

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 row/band. Stomata are slightly depressed below the level of the long cells (Plate 49*a-d*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 49*c,d*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 49*c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal solitary, paired; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 49*d,e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 49*d,e*).

MICROHAIRS.—Common to abundant; two-celled; basal longer, apical shorter; apex rounded (Plate 49*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 row/band. Intercostal

zone very narrow (Plate 50*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, elongate, variable. Papilla located near one end of cell and often overarching stoma (Plate 50*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1, 2, 3 or more/cell (?), irregular, globose, variable (Plate 50*a-c*).

PRICKLES.—Common; costal short macrohairs (Plate 50*d*).

SHORT CELLS.—Costal solitary, paired; intercostal solitary, paired (?). *Silica Cells*: Costal common; intercostal infrequent (?). *Cork Cells*: Costal common; intercostal infrequent (?) (Plate 50*e,f*).

SILICA BODIES.—Costal saddle-shaped, square, or sometimes tall and narrow; intercostal square (?), saddle-shaped (?) (Plate 50*e,f*).

MICROHAIRS.—None seen. May be obscured by or mistaken for papillae.

MACROHAIRS.—None seen.

Trichoneura ciliata (Peter) S.M. Phillips

PLATES 51–52

ABAXIAL

STOMATA.—Common; low-dome; 2 stomatal bands/intercostal zone, 1 row/band. Intercostal zone very narrow, grooved (Plate 51*a,b,d*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None or 1/cell, globose, uniform. Papilla small and located near one end of cell (Plate 51*c,d*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 51*d*).

PRICKLES.—Abundant; costal prickles, intercostal hooks (Plate 51*c,d*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not

seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 51*e*).

SILICA BODIES.—Costal dumbbell, ends rounded to straight or sometimes knobbed, middle wide, short; intercostal not seen (Plate 51*e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded (Plate 51*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome; 2 stomatal bands/intercostal zone, 1 or 2 rows/band. Intercostal zones very narrow, grooved (Plate 52*a,b*).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 52*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 52*d*).

PRICKLES.—Abundant; costal prickles; intercostal hooks. Some of the costal prickles are straight (Plate 52*d*).

SHORT CELLS.—Costal paired, 3–5/row, >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 52*e*).

SILICA BODIES.—Costal and intercostal dumbbell; ends rounded to straight or sometimes knobbed; middle wide, short (Plate 52*e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded (Plate 52*f*).

MACROHAIRS.—None seen.

Tripogon major Hook f.

PLATES 53–54

ABAXIAL

STOMATA.—Infrequent, low-dome to triangular, 1 (?) stomatal band/intercostal zone, 1 (?) row/band. Stomata obscure, sunken in grooves (Plate 53*a,b*).

INTERSTOMATAL CELLS.—Rectangular to

long, narrow, width uniform; ends markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 53c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 53a,c).

PRICKLES.—Infrequent; marginal prickles only (Plate 53e).

SHORT CELLS.—Costal >5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 53a,c,d).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 53d,f).

MICROHAIRS.—Infrequent (marginal only); two-celled; basal longer, apical shorter; apex rounded (Plate 53f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome; 1 or sometimes 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 54b,c).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, irregular, globose, variable (Plate 54c,d).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, irregular, globose, variable (Plate 54c,d).

PRICKLES.—Common; costal prickles (Plate 54e).

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Bodies*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal common. Cork cells papillate (Plate 54d,e).

SILICA BODIES.—Costal and intercostal saddle-shaped. Often with lateral knobs (Plate 54d,e).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded (Plate 54e).

MACROHAIRS.—Common; intercostal; raised basal cells absent. Shaft of macrohair twisted giving the appearance of a double helix (Plate 54a,f).

Tribe CHLORIDEAE

Brachyachne fulva Stapf

PLATES 55-56

ABAXIAL

STOMATA.—Common to abundant; triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 55a,b).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 55c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 55a,c,e).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal and intercostal abundant (Plate 55d,e).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 55d).

MICROHAIRS.—Abundant; one-celled (Plate 55f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 56a-c).

INTERSTOMATAL CELLS.—Long, narrow, width uniform; ends slightly concave (?); outline of walls indeterminable. *Papillae*: 3 or more/cell, irregular to almost in two rows, globose, uniform (Plate 56c).

LONG CELLS.—Long, narrow, width uniform; outline of walls indeterminable. *Papillae*: 3 or more/cell, irregular, globose, uniform (Plate 56b,c).

PRICKLES.—Infrequent; costal and intercostal prickles (Plate 56d).

SHORT CELLS.—Costal >5/row; intercostal

solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common to abundant (Plate 56*e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 56*e*).

MICROHAIRS.—Common to abundant; one-celled. Papillate cells form ring at base of microhair (Plate 56*f*).

MACROHAIRS.—None seen.

Chloris virgata Swartz

PLATES 57–58

ABAXIAL

STOMATA.—Abundant; low-dome; 2 or sometimes 1 stomatal band/intercostal zone, 1, 2, or sometimes 4 rows/band (Plate 57*a,b,e*).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 57*c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell. Outline of walls discernable mainly in marginal areas (Plate 57*d–f*).

PRICKLES.—Infrequent; costal prickles (Plate 57*c*).

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent, marginal only. *Cork Cells*: Costal abundant; intercostal abundant. Cork cells usually papillate (Plate 57*c,e,f*).

SILICA BODIES.—Costal saddle-shaped; intercostal saddle-shaped, in marginal area only (Plate 57*c,e,f*).

MICROHAIRS.—Infrequent (?); one-celled. The one-celled, spherical microhair apparently thin-walled, usually deflated and hard to distinguish from papilla (Plate 57*d*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Infrequent; low-dome or sometimes triangular; distribution indeterminable because of infrequent occurrence of stomata. Stomata abundant near margin (Plate 58*b,f*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex or sometimes slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen or sometimes 1 near end of cell, globose, uniform (Plate 58*b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; nonsinuous to markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 58*c*).

PRICKLES.—Common; costal and intercostal prickles (Plate 58*a,c*).

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common to abundant (Plate 58*d,e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 58*d,e*).

MICROHAIRS.—Common; one-celled. Spherical cell usually deflated (Plate 58*f*).

MACROHAIRS.—None seen.

Chrysochloa orientalis (C.E. Hubbard) Swallen

PLATES 59–60

ABAXIAL

STOMATA.—Abundant; low-dome to triangular; 4 or 1 (marginal and midvein area) stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 59*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Nonpapillate in marginal areas and near midvein. Papilla usually near one end of cell (Plate 59*b,c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking,

raised. *Papillae*: 1/cell, globose, uniform (Plate 59*a,b*).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only), paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal and intercostal abundant. Intercostal cork cells papillate (Plate 59*b,d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 59*d,e*).

MICROHAIRS.—Common; one-celled (Plate 59*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular or sometimes low-dome; 5 to 6 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 60*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; outline of walls not discernible because of wax. *Papillae*: 1/cell, globose, uniform. Papilla usually located near one end of cell (Plate 60*c*).

LONG CELLS.—Rectangular; outline of walls not discernible because of wax. *Papillae*: 1/cell, globose, uniform. Papilla usually located near one end of cell (Plate 60*c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only) paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal and intercostal abundant. Intercostal cork cells papillate (Plate 60*c-e*).

SILICA BODIES.—Costal and intercostal saddle-shape (Plate 60*d,e*).

MICROHAIRS.—Infrequent to common; one-celled (Plate 60*f*).

MACROHAIRS.—None seen.

Ctenium somalense (Chiovenda) Chiovenda

PLATES 61-62

ABAXIAL

STOMATA.—Common to abundant; low-dome to triangular; 2 stomatal bands/intercostal zone,

1 or 2 rows/band. Stomata usually sunken in intercostal groove (Plate 61*a-c*).

INTERSTOMATAL CELLS.—Rectangular to sometimes long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, pairs or sometimes irregular, globose, variable. A pair of papillae is usually located on each end of the interstomatal cell (Plate 61*c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row to irregular, globose, variable. Costal long cells sometimes without papillae (Plate 61*a,c,d*).

PRICKLES.—Abundant; costal and intercostal prickles (Plate 61*a,e*).

SHORT CELLS.—Costal solitary, paired, 3-5/row, >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 61*c,d*).

SILICA BODIES.—Costal dumbbell, ends straight to concave, middle narrow, long to short (Plate 61*d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Apical cell often and basal cell sometimes deflated (Plate 61*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band. Stomata usually sunken in intercostal grooves (Plate 62*a-c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 62*b,c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or sometimes 3 or more/cell, irregular, globose, uniform. Papillae found on only a few intercostal long cells (Plate 62*c,f*).

PRICKLES.—Abundant; costal and intercostal prickles (Plate 62*a,d*).

SHORT CELLS.—Costal paired, 3–5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 62*d,e*).

SILICA BODIES.—Costal dumbbell, ends concave to straight, middle narrow, long; intercostal not seen (Plate 62*d,e*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Apical cell deflated (Plate 62*f*).

MACROHAIRS.—None seen.

Cynodon plectostachyus (K. Schumann) Pilger

PLATES 63–64

ABAXIAL

STOMATA.—Common; triangular or sometimes low-dome; 2 stomatal bands/intercostal zone, 1 row/band. Stomata often obscured in grooves (Plate 63*b*).

INTERSTOMATAL CELLS.—Rectangular; slightly concave; outline of walls not discernable because of wax. *Papillae*: 1/cell, globose, uniform (Plate 63*b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; outline of walls not discernable because of wax. *Papillae*: 1/cell, globose to elongate, uniform (Plate 63*a,c*).

PRICKLES.—Common; costal and occasionally intercostal prickles (Plate 63*b,c*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 63*c*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 63*c*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 63*d*).

MACROHAIRS.—Abundant; intercostal; basal cells markedly raised (Plate 63*e,f*).

ADAXIAL

STOMATA.—Common; low-dome to triangular, 2 stomatal bands/intercostal zone, 1 row/

band. Stomata often obscured in grooves (Plate 64*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex or slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla usually located near one end of cell. *Papillae* small, warty near margin (Plate 64*b*).

LONG CELLS.—Rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla usually located near one end of cell. *Papillae* small, warty near margin (Plate 64*b,c*).

PRICKLES.—Abundant; costal prickles (Plate 64*c*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal and intercostal abundant. Intercostal and some costal cork cells papillate (Plate 64*d,f*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 64*d*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 64*e*).

MACROHAIRS.—Infrequent to common; intercostal; basal cells markedly raised (Plate 64*a,f*).

Daknopholis boivinii (A. Camus) W.D. Clayton

PLATES 65–66

ABAXIAL

STOMATA.—Common; low-dome to triangular; 1 stomatal band/intercostal zone, 2 (?) rows/band. Some stomata obscured in grooves and distribution difficult to determine (Plate 65*b,c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, uniform (Plate 65*b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, uniform (Plate 65*c*).

PRICKLES.—Infrequent; costal prickles on mid-vein and margin (Plate 65a).

SHORT CELLS.—Costal >5 /row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent to common. *Cork Cells*: Costal abundant; intercostal infrequent to common. Cork cells papillate (Plate 65b,d,e).

SILICA BODIES.—Costal saddle-shaped, cross-shaped; intercostal saddle-shaped to narrowly cross-shaped (Plate 65b,d,e).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 65f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 (?) stomatal bands/intercostal zone, 1 (?) row/band (Plate 66b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly to markedly concave; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, uniform (Plate 66b).

LONG CELLS.—Rectangular; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, uniform (Plate 66a,c).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5 /row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common. Cork cells often papillate (Plate 66c-e).

SILICA BODIES.—Costal saddle-shaped, cross-shaped; intercostal not seen (Plate 66d).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short; apex rounded (Plate 66f).

MACROHAIRS.—None seen.

Enteropogon macrostachyus (A. Richard) Bentham

PLATES 67-68

ABAXIAL

STOMATA.—Abundant; triangular or sometimes low-dome; 1 stomatal band/intercostal

zone, 2 rows/band. Stomata sometimes slightly obscured by papillae of surrounding long cells (Plate 67b,c).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform (Plate 67c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform (Plate 67d,f).

PRICKLES.—Abundant; costal prickles (Plate 67d).

SHORT CELLS.—Costal >5 /row or sometimes solitary, paired, 3-5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 67a,d,e).

SILICA BODIES.—Costal narrowly saddle-shaped; intercostal not seen (Plate 67e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded (Plate 67f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular or sometimes low-dome; 2 stomatal bands/intercostal zone, 2 rows/band (Plate 68b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 68c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 68c,d).

PRICKLES.—Abundant; costal prickles (Plate 68a,d).

SHORT CELLS.—Costal 3-5/row, >5 /row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common (Plate 68d,e).

SILICA BODIES.—Costal narrowly saddle-shaped; intercostal not seen (Plate 68e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded (Plate 68f).

MACROHAIRS.—None seen.

***Eustachys paspaloides* (Vahl) Lanza and Mattei**

PLATES 69-70

ABAXIAL

STOMATA.—Abundant; low-dome to triangular; 1 stomatal band/intercostal zone, 3 or 4 rows/band. Subsidiary cell somewhat obscured by wax (Plate 69*a,b*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex; outline of walls not discernable because of wax. *Papillae*: 1/cell, globose, uniform (Plate 69*b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform (Plate 69*c*).

PRICKLES.—Abundant; costal prickles (Plate 69*a,c*).

SHORT CELLS.—Costal 3-5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 69*c,d*).

SILICA BODIES.—Costal saddle-shaped sometimes narrowly so; intercostal not seen (Plate 69*d*).

MICROHAIRS.—Infrequent; two-celled; basal longer, apical shorter; apex rounded (Plate 69*e*).

MACROHAIRS.—Common; intercostal; basal cells markedly raised—usually on one side of base only (Plate 69*f*).

ADAXIAL

STOMATA.—Infrequent to common; low-dome or sometimes triangular; 1 stomatal band/intercostal zone, 1 row/band (Plate 70*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 70*b,c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 70*a*).

PRICKLES.—Infrequent; costal and marginal prickles (Plate 70*d,e*).

SHORT CELLS.—Costal >5/row or sometimes 3-5/row, paired; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 70*a,f*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 70*f*).

MICROHAIRS.—None seen.

MACROHAIRS.—None seen.

***Microchloa kunthii* Desvaux**

PLATES 71-72

ABAXIAL

STOMATA.—Abundant; low-dome to triangular; 1 or 2 stomatal bands/intercostal zone, 1 row/band. Subsidiary cells often collapsed (Plate 71*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex, slightly concave, markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 71*b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None to 3 or more/cell, irregular, globose, variable. *Papillae* very small (Plate 71*c*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary or sometimes paired. *Silica Cells*: Costal and intercostal abundant. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 71*c-e*).

SILICA BODIES.—Costal saddle-shaped; intercostal crenate-vertical or narrowly saddle-shaped (Plate 71*c-e*).

MICROHAIRS.—Common; one-celled; cells surrounding microhair often raised. Cell often missing or collapsed with only the surrounding basal cells evident (Plate 71*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome to triangular; distribution indeterminable because costal

zones not clear. Subsidiary cells often papillate (Plate 72a-c).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row or irregular, globose, uniform. Interstomatal cells near margin have no papillae (Plate 72c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell; single row or irregular, globose, uniform. Long cells near margin have no papillae (Plate 72b,c).

PRICKLES.—Infrequent; marginal prickles only.

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant (?); intercostal not seen. Costal silica cells alternate with cells that are collapsed and usually papillate, and it is not clear if these are cork cells (Plate 72c,d).

SILICA BODIES.—Costal saddle-shaped and cross-shaped; intercostal crenate-vertical, saddle-shaped, and cross-shaped (Plate 72c,d).

MICROHAIRS.—Common; one-celled; cells surrounding microhair often raised (Plate 72e).

MACROHAIRS.—Infrequent; basal cells slightly raised; macrohairs very long and twisted giving the appearance of a double-helix (Plate 72f).

Oropetium capense Stapf

PLATES 73-74

ABAXIAL

STOMATA.—Common; low-dome; 1 stomatal band/intercostal zone, 1 row/band (Plate 73a,b).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 73b,c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 73b,c).

PRICKLES.—Infrequent; marginal only.

SHORT CELLS.—Costal >5/row; intercostal not

seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 73d).

SILICA BODIES.—Costal saddle-shaped, some with lateral knobs; intercostal not seen (Plate 73d).

MICROHAIRS.—Abundant; one-celled (Plate 73e).

MACROHAIRS.—Infrequent; intercostal; basal cells markedly raised (Plate 73c,f).

ADAXIAL

STOMATA.—Abundant; low-dome; 2 stomatal band/intercostal zone, 1 row/band (Plate 74b,c).

INTERSTOMATAL CELLS.—Square to rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1, 2, 3, or more/cell, single row, globose, uniform (Plate 74b,c).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 3 or more/cell, single row, globose, variable (Plate 74b,c).

PRICKLES.—Abundant; marginal prickles, short macrohairs (Plate 74a,c).

SHORT CELLS.—Costal 3-5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 74d).

SILICA BODIES.—Costal saddle-shaped, square; intercostal not seen (Plate 74d).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short or basal slightly longer than apical; apex rounded (Plate 74e).

MACROHAIRS.—Abundant; intercostal; basal cells slightly raised (Plate 74f).

Rendlia altera (Rendle) Chiovenda

PLATES 75-76

ABAXIAL

STOMATA.—Abundant; low-dome; 1 stomatal band/intercostal zone, 2 or 3 rows/band (Plate 75a,b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex, markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 75*b*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 75*c*).

PRICKLES.—Infrequent; costal and intercostal prickles (Plate 75*d*).

SHORT CELLS.—Costal paired, 3–5/row, >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 75*c–e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 75*c–e*).

MICROHAIRS.—Abundant; one-celled (Plate 75*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—None seen.

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 76*b*).

PRICKLES.—Infrequent; costal prickles (Plate 76*c*).

SHORT CELLS.—Costal >5/row; intercostal solitary. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 76*d,e*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 76*a,d*).

MICROHAIRS.—Common; one-celled (Plate 76*f*).

MACROHAIRS.—None seen.

Schoenefeldia transiens (Pilger) Chiovenda

PLATES 77–78

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 77*b,c*).

INTERSTOMATAL CELLS.—Square, rectangu-

lar, long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 77*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 77*c*).

PRICKLES.—Common; costal and occasionally intercostal prickles (Plate 77*a,d*).

SHORT CELLS.—Costal >5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 77*c,e,f*).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 77*e,f*).

MICROHAIRS.—None seen.

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 78*b,c*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 78*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 78*a,c*).

PRICKLES.—Common; costal and intercostal prickles (Plate 78*d*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary and seen only in marginal area. *Silica Cells*: Costal common; intercostal infrequent. *Cork Cells*: Costal common; intercostal infrequent (Plate 78*e*).

SILICA BODIES.—Costal; saddle-shaped; intercostal saddle-shaped or sometimes cross-shaped (Plate 78*e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 78*f*).

MACROHAIRS.—None seen.

***Tetrapogon tenellus* (Roxburgh) Chiovenda**

PLATES 79–80

ABAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band. Stomata often more or less obscured in grooves (Plate 79*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex to slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 79*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 79*c*).

PRICKLES.—Common; costal prickles (Plate 79*a,d*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 79*c-e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 79*c-e*).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short; apex rounded (Plate 79*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 or 2 rows/band (Plate 80*a,b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends markedly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 80*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell. Intercostal zones narrow and often forming a groove (Plate 80*a,d*).

PRICKLES.—Common; costal prickles and intercostal hooks (Plate 80*a,d*).

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal common. Cork Cells often papillate with papillae usually deflated (Plate 80*d,e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 80*d,e*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (Plate 80*f*).

MACROHAIRS.—None seen.

Tribe SPOROBOLAEAE

***Crypsis schoenoides* (Linnaeus) Lamarck**

PLATES 81–82

ABAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 81*a,b*).

INTERSTOMATAL CELLS.—Square to rectangular; slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cell slightly raised, especially evident in side view (Plate 81*c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen. Long cells adjacent to stomata with raised area opposite the stoma (Plate 81*b-d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row or sometimes solitary; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal common (Plate 81*c,d*).

SILICA BODIES.—Costal saddle-shaped or sometimes dumbbell, ends rounded to straight, middle wide, short; intercostal saddle-shaped (Plate 81*c,d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded, usually deflated (Plate 81*e*).

MACROHAIRS.—Common; intercostal; basal cells markedly raised (Plate 81*f*).

ADAXIAL

STOMATA.—Abundant; triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 82*a, b*).

INTERSTOMATAL CELLS.—Rectangular; slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen. Cell slightly raised especially when seen in side view (Plate 82*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 82*d*).

PRICKLES.—Abundant; costal prickles and short macrohairs (Plate 82*a*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 82*a, d*).

SILICA BODIES.—Costal cross-shaped, dumbbell, ends rounded to straight, middle wide, short; intercostal not seen (Plate 82*a, d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded, usually deflated (Plate 82*e*).

MACROHAIRS.—Common; intercostal (Plate 82*f*).

***Sporobolus africanus* (Poiret) Robyns and Tournay**

PLATES 83–84

ABAXIAL

STOMATA.—Abundant; low-dome; 1 stomatal band/intercostal zone, 1 row/band. Intercostal zone very narrow (Plate 83*b*).

INTERSTOMATAL CELLS.—Rectangular; slightly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 83*c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 83*d*).

PRICKLES.—None seen.

SHORT CELLS.—Costal paired, 3–5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal common (Plate 83*d, e*).

SILICA BODIES.—Costal and intercostal shape variable ranging from round to square to elliptical to crescent-shaped to saddle-shaped (Plate 83*a, d, e*).

MICROHAIRS.—Common; one-celled (Plate 83*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome to triangular; 2 stomatal bands/intercostal zone, 1 row/band (Plate 84*a, b*).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell except marginal interstomatals which lack papillae, globose, uniform. The papillae are very small and are located at the end of the cell. There are usually two interstomatal cells between adjacent stomata (Plate 84*b, c*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 84*c, d*).

PRICKLES.—Common; costal prickles (Plate 84*d*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 84*e*).

SILICA BODIES.—Costal dumbbell, ends rounded to straight, middle wide, short or sometimes nodular; intercostal not seen (Plate 84*e*).

MICROHAIRS.—None seen.

MACROHAIRS.—Infrequent; intercostal; basal cells slightly raised (Plate 84*f*).

Tribe LEPTUREAE

Lepturus repens (G. Forster) R. Brown

PLATES 85–86

ABAXIAL

STOMATA.—Common; triangular; 2 stomatal bands/intercostal zone, 1 row/band. Shape of subsidiary cell often obscured by wax (Plate 85a, b).

INTERSTOMATAL CELLS.—Rectangular to long, narrow, width uniform; ends straight to convex; outline of walls indeterminable because of wax. *Papillae*: 2, 3, or more/cell, single row, globose, variable (Plate 85c).

LONG CELLS.—Long, narrow, width uniform; outline of walls indeterminable. *Papillae*: 3 or more/cell, single row, globose, variable. *Papillae* are compound, doubly papillate (Plate 85a,c,d).

PRICKLES.—Common; costal prickles (Plate 85d).

SHORT CELLS.—Costal >5 /row; intercostal paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal common. Cork cells papillate (Plate 85a,d,e).

SILICA BODIES.—Costal and intercostal narrowly saddle-shaped (Plate 85d,e).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short, or basal longer, apical shorter; apex rounded (Plate 85f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Frequency indeterminable because wax and papillae obscure stomata; triangular (?); distribution indeterminable (Plate 86b).

LONG CELLS.—Long, narrow, width uniform; outline of walls indeterminable. *Papillae*: 3 or more/cell, single row, globose, variable. *Papillae* often compound, doubly or sometimes triply papillate (Plate 86c,d,f).

PRICKLES.—Common to abundant; costal prickles (Plate 86a,c).

SHORT CELLS.—Costal >5 /row; intercostal paired. *Silica Cells*: Costal abundant; intercostal common. *Cork Cells*: Costal abundant; intercostal common. Cork cells papillate (Plate 86d,e).

SILICA BODIES.—Costal and intercostal saddle-shaped (Plate 86d,e).

MICROHAIRS.—Infrequent (?); two-celled; basal longer, apical shorter (?); apex rounded (?). Only one microhair observed. It is difficult to distinguish between microhairs and papillae (Plate 86f).

MACROHAIRS.—None seen.

Tribe ZOYSIEAE

Dignathia gracilis Stapf

PLATES 87–88

ABAXIAL

STOMATA.—Common; low-dome; 1 stomatal band/intercostal zone, 1 row/band (Plate 87b,d).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla often located near one end of cell (Plate 87c,d).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None or 1/cell, globose, uniform. Papilla often located near one end of cell (Plate 87a,d).

PRICKLES.—Common; costal prickles (Plate 87d).

SHORT CELLS.—Costal paired, 3–5/row, >5 /row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 87d,e).

SILICA BODIES.—Costal dumbbell, ends straight or sometimes rounded, middle narrow, long and short; intercostal not seen (Plate 87e).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Basal and apical cells often collapsed (Plate 87f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 88*b,c*).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 88*b,c*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell. Long cells in mid-intercostal region deflated, features indistinct (Plate 88*a,c*).

PRICKLES.—Common; costal prickles (Plate 88*a*).

SHORT CELLS.—Costal 3–5/row, >5/row; intercostal solitary (cork cells only), paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 88*c,d*).

SILICA BODIES.—Costal dumbbell, ends straight to rounded, middle narrow, long; intercostal cross-shaped (Plate 88*c,d*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Basal and apical cells often collapsed. Microhairs often located on veins (Plate 88*e*).

MACROHAIRS.—Common; intercostal; basal cells slightly raised (Plate 88*f*).

***Farrago racemosa* W.D. Clayton**

PLATES 89–90

ABAXIAL

STOMATA.—Common (?); low-dome or sometimes triangular; 1 (?) stomatal band/intercostal zone, 1 (?) row/band. Intercostal zone very narrow; distribution difficult to determine (Plate 89*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 89*b,c,e*).

LONG CELLS.—Long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 89*a,c,e*).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 89*d,e*).

SILICA BODIES.—Costal dumbbell, ends rounded or sometimes with knob on end, middle long, narrow (Plate 89*d*).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal in length, short; apex rounded (Plate 89*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome or triangular; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 90*b,c,e*).

INTERSTOMATAL CELLS.—Square to rectangular; ends slightly or sometimes markedly concave; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 90*a,c,e*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: None seen (Plate 90*e*).

PRICKLES.—Common; costal prickles (Plate 90*c*).

SHORT CELLS.—Costal >5/row; intercostal solitary (cork cells only). *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 90*d,e*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 90*d*).

MICROHAIRS.—Common; two-celled; basal and apical equal in length, short; apex rounded (?). Apical cell usually deflated (Plate 90*f*).

MACROHAIRS.—None seen.

Leptothrium senegalensis (Kunth)

W.D. Clayton

PLATES 91-92

ABAXIAL

STOMATA.—Common; low-dome; 1 stomatal band/intercostal zone, 1 or sometimes 2 rows/band. Intercostal zones very narrow (Plate 91a-c).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 91c).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 91b-d).

PRICKLES.—Abundant; costal prickles (Plate 91d).

SHORT CELLS.—Costal 3-5/row, >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 91e).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 91e).

MICROHAIRS.—Common to abundant; two-celled; basal longer, apical shorter; apex rounded. Apical and basal cells often deflated (Plate 91f).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Common; low-dome; 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 92a,b).

INTERSTOMATAL CELLS.—Square, rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 92b).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking,

raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 92c,d).

PRICKLES.—Common; costal prickles (Plate 92c).

SHORT CELLS.—Costal paired, 3-5/row, >5/row; intercostal paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 92d,e).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal cross-shaped or dumbbell, ends straight, middle wide, short (Plate 92d,e).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Microhairs often located on vein (Plate 92f).

MACROHAIRS.—None seen.

Perotis patens Gandoger

PLATES 93-94

ABAXIAL

STOMATA.—Common to abundant; low-dome or sometimes triangular; 1 stomatal band/intercostal zone, 1 or sometimes 2 rows/band (Plate 93a,b).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; markedly sinuous, interlocking, raised (?). *Papillae*: None seen. Cell raised (Plate 93b,c).

LONG CELLS.—Long, narrow, width uniform (?); markedly sinuous, interlocking, raised. *Papillae*: None seen. Features hard to determine because of collapsed cells (Plate 93c,d).

PRICKLES.—None seen.

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 93a,d).

SILICA BODIES.—Costal dumbbell, ends straight or sometimes rounded, middle wide, short; intercostal not seen (Plate 93d,e).

MICROHAIRS.—Infrequent; two-celled; basal and apical equal, short; apex rounded. Apical cell

often deflated. Raised cells at base of microhair (Plate 93*e*).

MACROHAIRS.—Infrequent (marginal only); raised basal cells absent (Plate 93*f*).

ADAXIAL

STOMATA.—Abundant; low-dome to triangular; 2 stomatal bands /intercostal zone, 1 or 2 rows/band (Plate 94*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; slightly sinuous. *Papillae*: None seen. Cells often collapsed (Plate 94*b,c*).

LONG CELLS.—Rectangular to long, narrow, width uniform (?); slightly sinuous (?). *Papillae*: None seen. Features hard to determine because of collapsed cells (Plate 94*c*).

PRICKLES.—Infrequent; costal prickles (Plate 94*a,c*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal common; intercostal not seen. *Cork Cells*: Costal common; intercostal not seen (Plate 94*d*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal not seen (Plate 94*d*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Often located on vein (Plate 94*a,e*).

MACROHAIRS.—Infrequent (marginal only); raised basal cells absent (Plate 94*f*).

Tetrachaete elionuroides Chiovenda

PLATES 95–96

ABAXIAL

STOMATA.—Common; triangular; 1 stomatal band/intercostal zone, 1 row/band (Plate 95*b,d*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 95*b,d*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking,

raised. *Papillae*: None or often 1/cell, globose, uniform (Plate 95*c,d*).

PRICKLES.—Common; costal prickles (Plate 95*c*).

SHORT CELLS.—Costal paired, 3–5/row, >5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent (Plate 95*a,d,e*).

SILICA BODIES.—Costal dumbbell, ends rounded, middle wide or narrow, long or short; intercostal cross-shaped to dumbbell, ends rounded, middle wide, short (Plate 95*d,e*).

MICROHAIRS.—Abundant; two-celled; basal longer, apical shorter; apex rounded. Basal and apical cells often deflated (Plate 95*f*).

MACROHAIRS.—None seen.

ADAXIAL

STOMATA.—Abundant; low-dome; 1 or sometimes 2 stomatal bands/intercostal zone, 2 rows/band (Plate 96*a,b*).

INTERSTOMATAL CELLS.—Square to rectangular; ends straight to convex; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell and often deflated (Plate 96*a,b*).

LONG CELLS.—Rectangular to long, narrow, width uniform; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 96*a*).

PRICKLES.—Abundant; costal prickles (Plate 96*c*).

SHORT CELLS.—Costal solitary, paired, 3–5/row, >5/row; intercostal solitary, paired. *Silica Cells*: Costal abundant; intercostal infrequent. *Cork Cells*: Costal abundant; intercostal infrequent. Intercostal cork cells papillate (Plate 96*c,d*).

SILICA BODIES.—Costal dumbbell, ends straight, middle wide, short; intercostal cross-shaped (Plate 96*c,d*).

MICROHAIRS.—Common; two-celled; basal longer, apical shorter; apex rounded. Basal and

apical cells often deflated (Plate 96*e*).

MACROHAIRS.—Common; intercostal; basal cells markedly raised (Plate 96*f*).

Tragus berteronianus Schultes

PLATES 97–98

ABAXIAL

STOMATA.—Common; low-dome; 1 stomatal band/intercostal zone, 1 or sometimes 2 rows/band. Intercostal zones very narrow, stomata obscured in grooves (Plate 97*b,c*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave (?); markedly sinuous, interlocking, raised. *Papillae*: None or 1/cell, globose, uniform. Papillae located near one end of cell. Cells usually collapsed (Plate 97*c*).

LONG CELLS.—Rectangular; markedly sinuous, interlocking, raised. *Papillae*: 1/cell, globose, uniform. Papilla usually located near one end of cell (Plate 97*b,c*).

PRICKLES.—Infrequent; marginal prickles and short macrohairs (Plate 97*f*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen (Plate 97*c,d*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 97*a,d*).

MICROHAIRS.—Infrequent; two-celled; basal longer, apical shorter; apex rounded (Plate 97*e*).

MACROHAIRS.—Infrequent (marginal only); raised basal cells absent. See Prickles (Plate 97*f*).

ADAXIAL

STOMATA.—Common; low-dome; 1 or 2 stomatal bands/intercostal zone, 1 or sometimes 2 rows/band (Plate 98*b*).

INTERSTOMATAL CELLS.—Rectangular; ends slightly concave; nonsinuous (?). *Papillae*: 1/cell, globose, uniform. Papilla located near one end of cell (Plate 98*b,c*).

LONG CELLS.—Square to rectangular; nonsinuous (?). *Papillae*: 1/cell (?), globose, uniform. Outline of cell walls not discernable because of wax (Plate 98*a,c*).

PRICKLES.—Infrequent; intercostal and marginal prickles; marginal short macrohairs (Plate 98*d,f*).

SHORT CELLS.—Costal >5/row; intercostal not seen. *Silica Cells*: Costal abundant; intercostal not seen. *Cork Cells*: Costal abundant; intercostal not seen. Cork cells often papillate (Plate 98*d,e*).

SILICA BODIES.—Costal saddle-shaped; intercostal not seen (Plate 98*e*).

MICROHAIRS.—None seen.

MACROHAIRS.—Infrequent (marginal only); raised basal cells absent. See Prickles (Plate 98*f*).

APPENDIX

Material Studied

<i>Species</i>	<i>Collection</i>	<i>Origin</i>	<i>Herbarium</i>
<i>Acrachne racemosa</i>	Williams s.n., 20 April 1947	Kenya	K
<i>Apochiton burttii</i>	Greenway and Polhill 11513	Tanganyika	K
<i>Aristida scabrivalvis</i>	Galpin M427	Transvaal	US
<i>Bewisia biflora</i>	Davidse 6471	Rhodesia	US
<i>Brachyachne fulva</i>	Simon and Williamson 1617	Zambia	K
<i>Chloris virgata</i>	Shantz 509	Belgian Congo	US
<i>Chrysochloa orientalis</i>	Lebrum 7949	Belgian Congo	MO
<i>Coelachyrum longiglume</i>	Senyimba 365	Kenya	K
<i>Crypsis schoenoides</i>	Chase 6983	Mozambique	US
<i>Crypsis schoenoides</i>	US 1126567	Egypt	US
<i>Ctenium somalense</i>	Hill 312	Rhodesia	MO
<i>Cynodon plectostachyus</i>	Verdcourt 2190	Kenya	US
<i>Cypholepis yemenica</i>	Glover and Gilland 745	Somaliland	US
<i>Dactyloctenium giganteum</i>	Bullock 305	Tanganyika	US
<i>Daknopholis boivinii</i>	Croat 30897	Madagascar	MO
<i>Dignathia gracilis</i>	Polhill and Paulo 650	Kenya	K
<i>Dinebra retroflexa</i>	Bullock 302	Tanganyika	US
<i>Diplachne fusca</i>	Siame 596	Tanzania	MO
<i>Drake-Brockmania haareri</i>	Drummond and Hemsley 2287	Tanganyika	MO
<i>Eleusine floccifolia</i>	Westphal and Westphal- Stevens 1572	Ethiopia	MO
<i>Enneapogon cenchroides</i>	Carr 166	Kenya	MO
<i>Enneapogon cenchroides</i>	Davidse 6112	S. Africa	US
<i>Enteropogon macrostachyus</i>	Faden 74/1146	Kenya	MO
<i>Eragrostiella bifaria</i>	Faden 74/967	Kenya	MO
<i>Eragrostis macilenta</i>	Kabuye 364	Kenya	US
<i>Eustachys paspaloides</i>	Magogo and Glover 372	Kenya	MO

<i>Farrago racemosa</i>	Anderson 1316	Tanzania	K
<i>Halopyrum mucronatum</i>	Polhill and Paulo 766	Kenya	K
<i>Harpachne schimperi</i>	Tanner 424	Tanganyika	K
<i>Leptocarydion vulpiastrum</i>	Verdcourt 768	Uganda	MO
<i>Leptochloa obtusiflora</i>	Webster K164	Kenya	K
<i>Leptothrium senegalensis</i>	Robertson 1788	Tanzania	MO
<i>Lepturus repens</i>	Bogdan 3642	Kenya	US
<i>Lintonia nutans</i>	Magogo 1351	Kenya	MO
<i>Microchloa kunthii</i>	Gilbert and Thulin 823	Ethiopia	MO
<i>Odyssea paucinervis</i>	Greenway and Kanuri 12576	Tanganyika	K
<i>Oropetium capense</i>	Pappi 7124	Eritrea	US
<i>Perotis patens</i>	Crook 938	Rhodesia	MO
<i>Pogonarthria squarrosa</i>	Davidse and Handlos 7256	Zambia	MO
<i>Pogoneura biflora</i>	Greenway and Turner 10608	Tanzania	K
<i>Psilolemma jaegeri</i>	Bullock 2518	Tanganyika	K
<i>Rendlia altera</i>	Robinson 6362	N. Rhodesia	US
<i>Schmidtia pappophoroides</i>	Godfrey and Acocks SH- 1641	Transvaal	US
<i>Schoenefeldia transiens</i>	Greenway 9781	Kenya	US
<i>Sporobolus africanus</i>	Maas 6094	Kenya	MO
<i>Stipagrostis uniplumis</i>	Faden 71/366	Kenya	K
<i>Tetrachaete elionuroides</i>	Greenway and Kanuri 12882	Kenya	K
<i>Tetrapogon tenellus</i>	Burger 623	Ethiopia	US
<i>Tragus berteronianus</i>	Faulkner 3706	Tanzania	K
<i>Trichoneura ciliata</i>	Bogdan AB4172	Kenya	K
<i>Tripogon major</i>	Thomas 2925	Uganda	K

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Plates

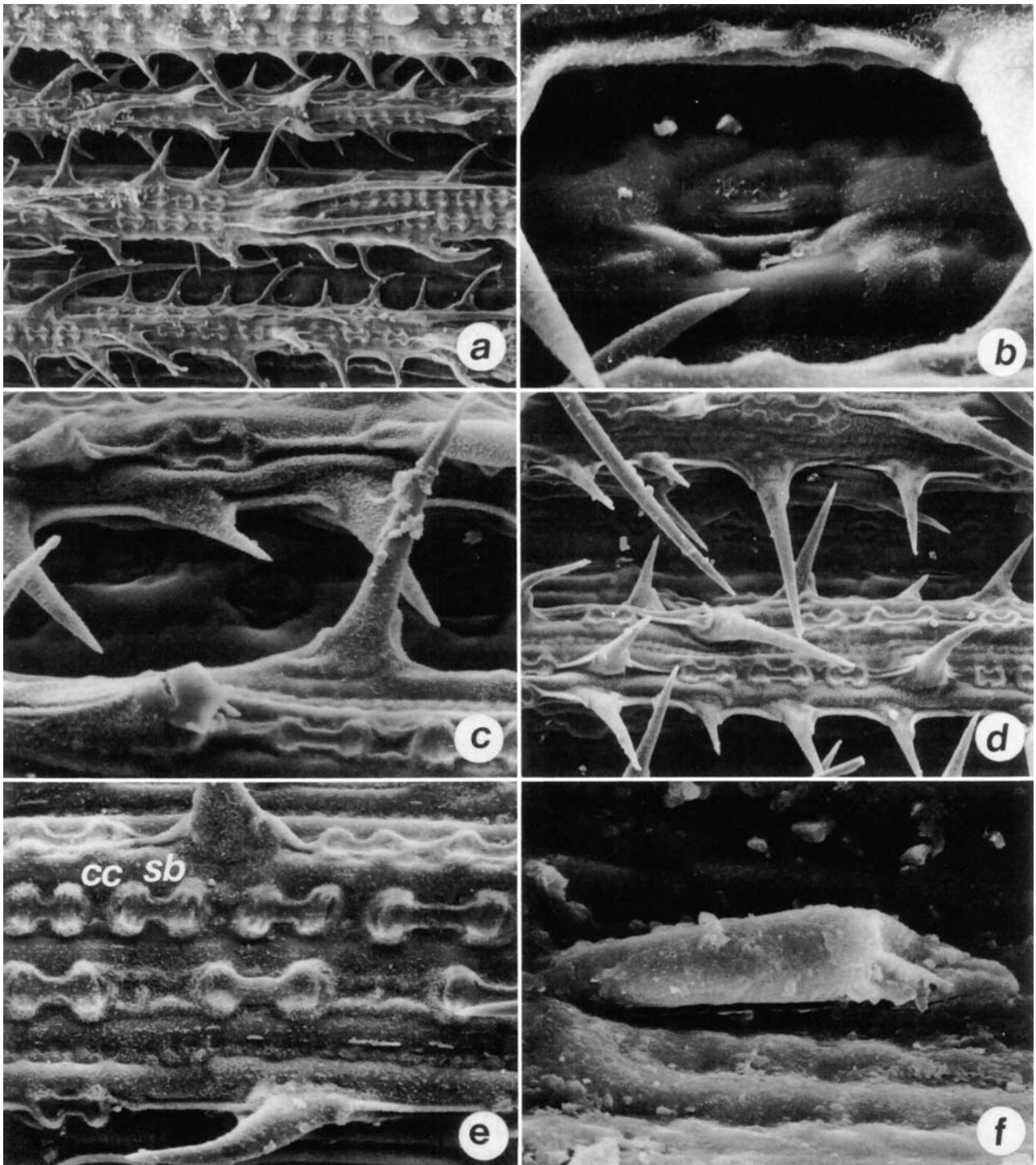


PLATE 1.—Abaxial epidermis *Aristida scabrivalvis*, Galpin M427: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, short macrohair, $\times 640$; *d*, long cells, costal prickles, short macrohairs, $\times 320$; *e*, costal silica body (sb), cork cell (cc), $\times 640$; *f*, microhair, $\times 1250$.

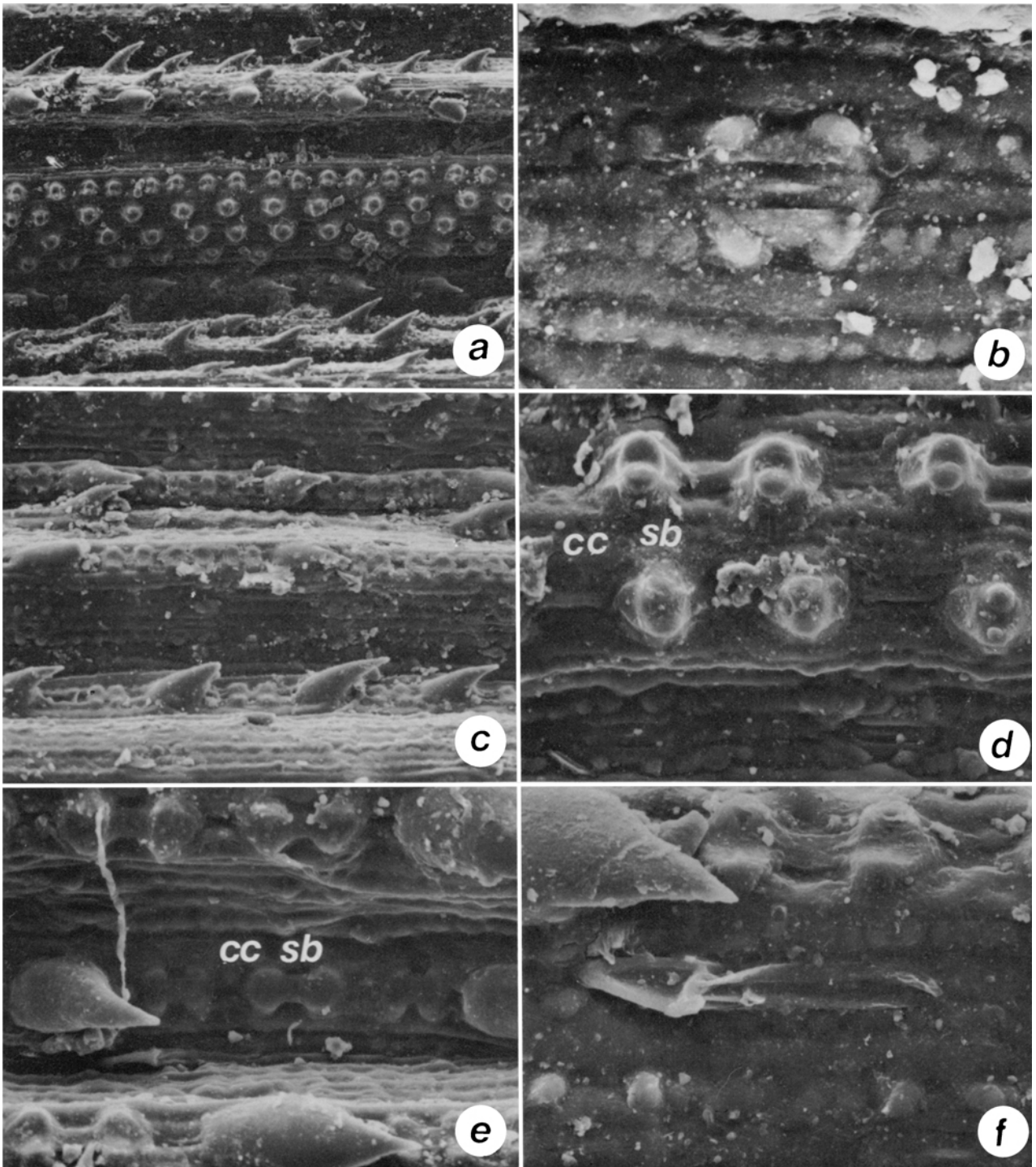


PLATE 2.—Adaxial epidermis *Aristida scabrivalvis*, Galpin M427: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, prickles, $\times 320$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, costal silica bodies (sb), cork cells (cc), $\times 640$; *f*, microhair, $\times 1250$.

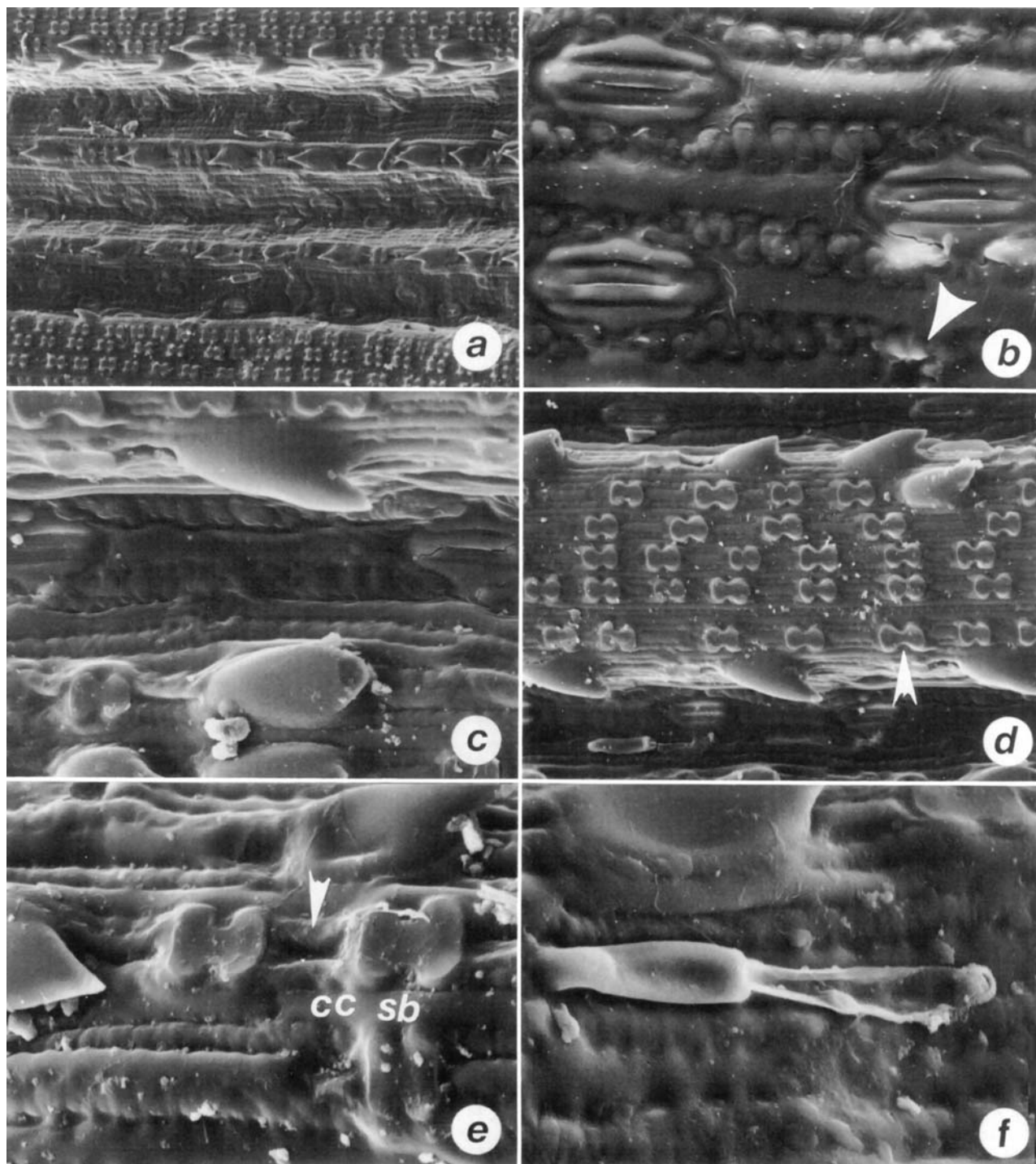


PLATE 3.—Abaxial epidermis *Stipagrostis uniplumis*, Faden 71/366: *a*, overview, $\times 160$; *b*, stomata, interstomatal cells, intercostal cork cell (arrow), $\times 896$; *c*, interstomatal cell, long cells, $\times 640$; *d*, long cells, prickles, costal silica bodies (arrow), $\times 320$; *e*, costal silica bodies, cork cell (arrow), intercostal silica body (sb), cork cell (cc), $\times 1250$; *f*, microhair, $\times 1250$.

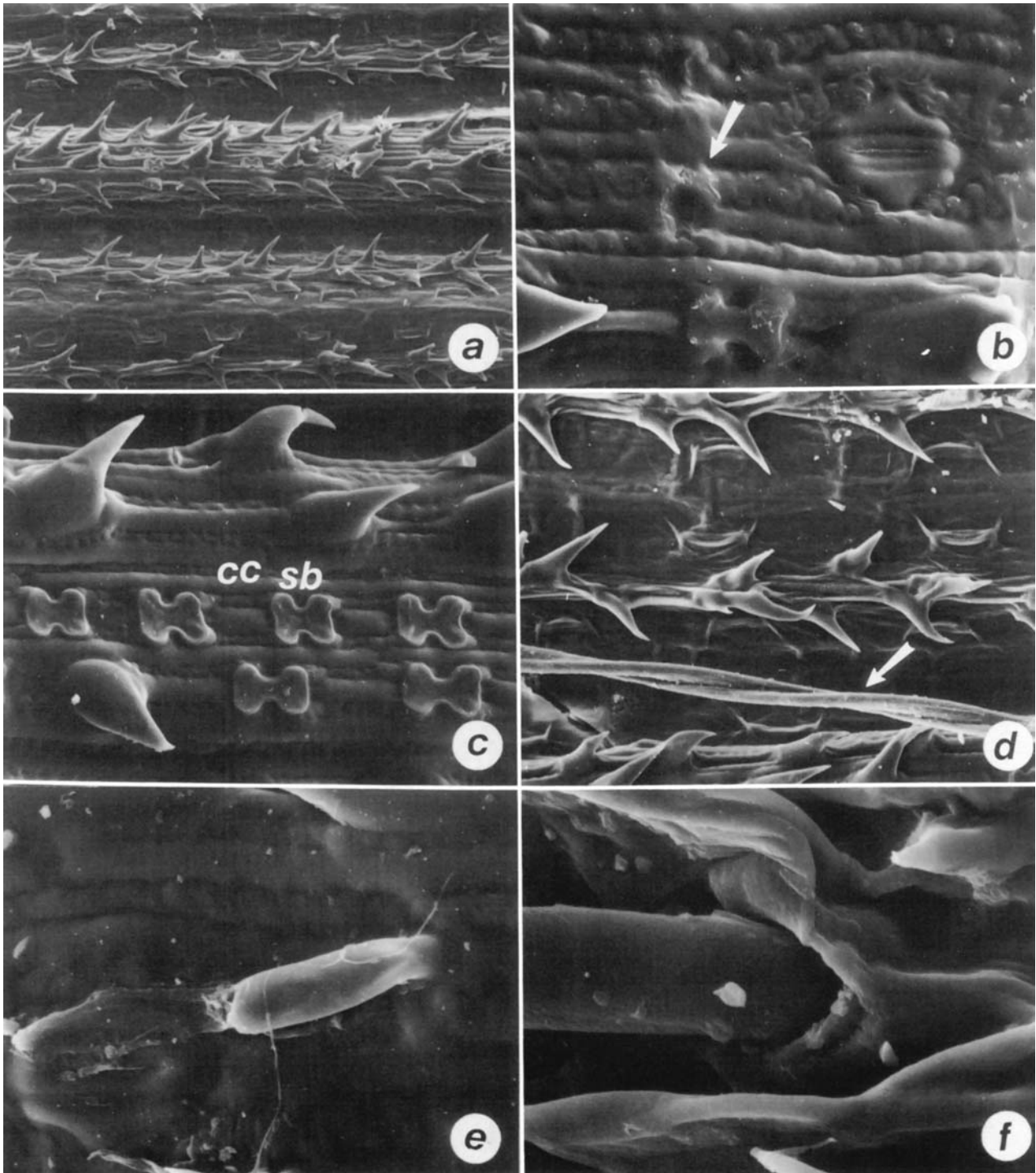


PLATE 4.—Adaxial epidermis *Stipagrostis uniplumis*, Faden 71/366: *a*, overview, $\times 160$; *b*, stomata, interstomatal cell, long cells, intercostal cork cell (arrow), $\times 768$; *c*, prickles, costal silica bodies (sb), cork cells (cc), $\times 640$; *d*, intercostal prickles, twisted shaft of macrohair (arrow), $\times 320$; *e*, microhair, $\times 1250$; *f*, base of macrohair, $\times 1375$.

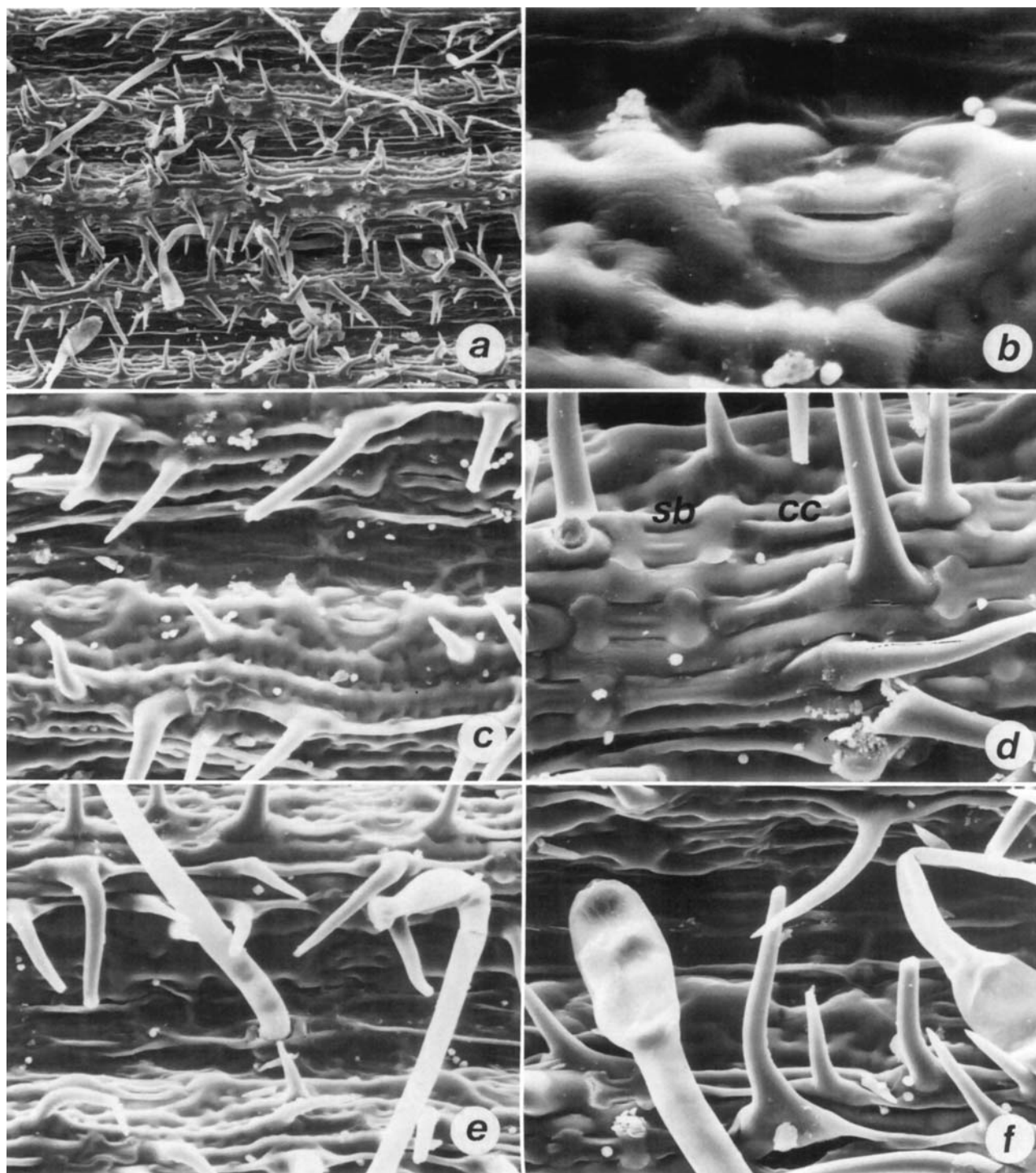


PLATE 5.—Abaxial epidermis *Enneapogon cenchroides*, Carr 166: *a*, overview, long cells, $\times 625$; *b*, stoma, $\times 1750$; *c*, interstomatal cell, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, base of microhair, $\times 640$; *f*, swollen tip of microhair, $\times 640$.

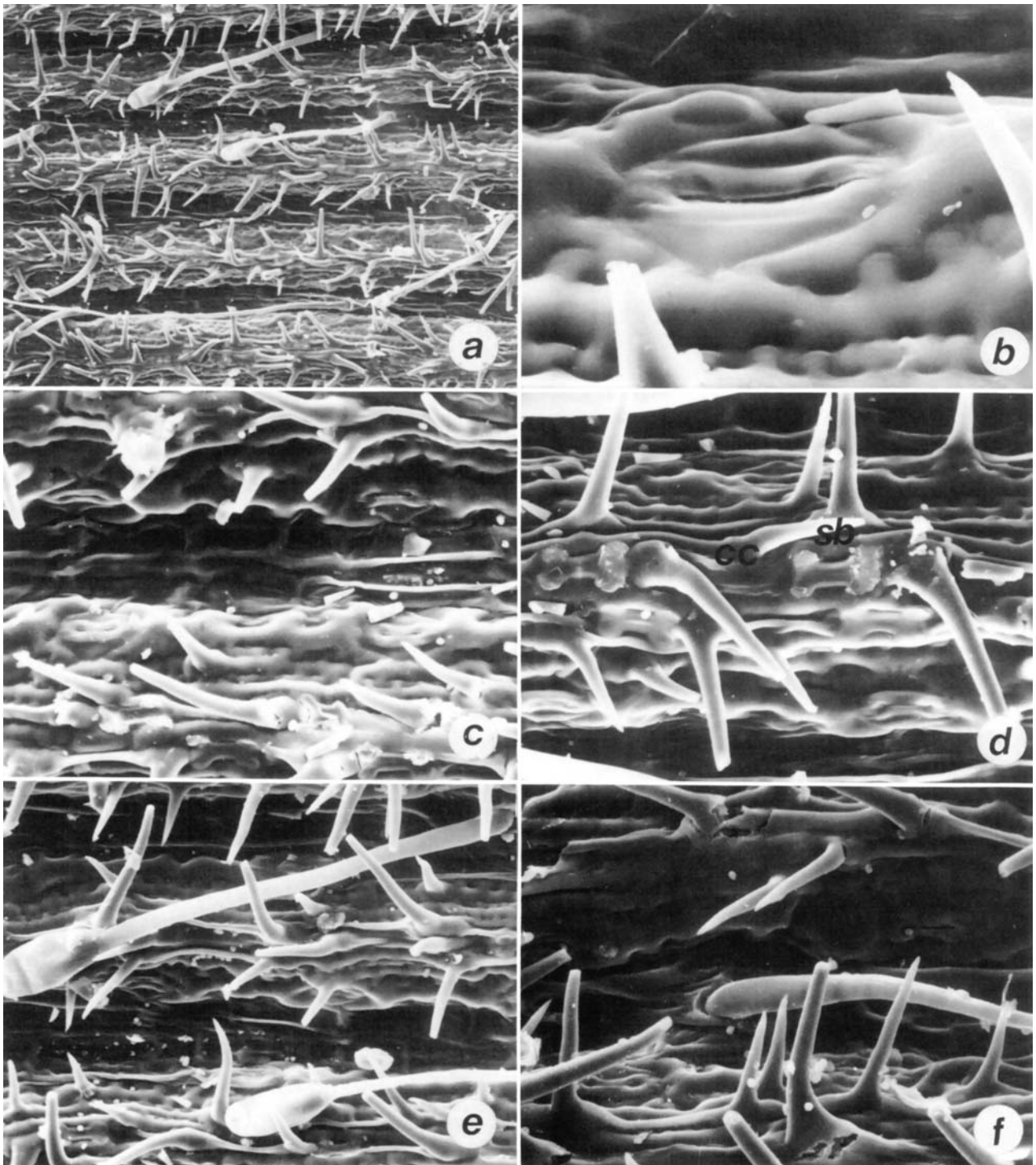


PLATE 6.—Adaxial epidermis *Enneapogon cenchroides*, Davidse 6112: *a*, overview, $\times 160$; *b*, stoma, $\times 1750$; *c*, interstomatal cell, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, microhair with swollen tip, $\times 640$; *f*, base of microhair, $\times 640$.

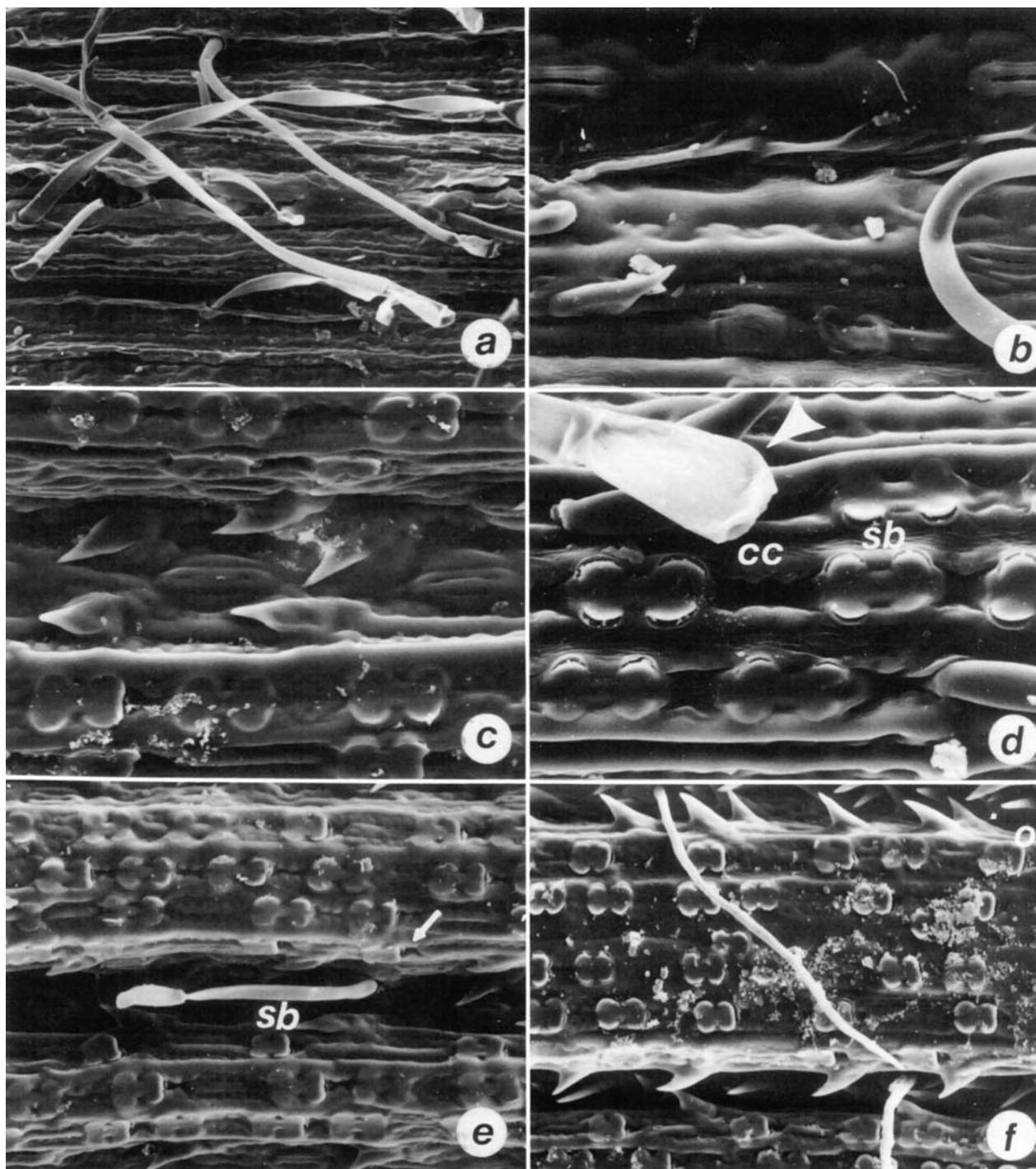


PLATE 7.—Abaxial epidermis *Schmidtia pappophoroides*, Godfrey and Acocks SH-1641: *a*, overview, $\times 160$; *b*, stomata, interstomatal cell, long cells, $\times 640$; *c*, prickles, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), apical cell of microhair (arrow), $\times 960$; *e*, microhair, intercostal silica bodies (sb), cork cells (arrow), $\times 384$; *f*, macrohairs, $\times 320$.

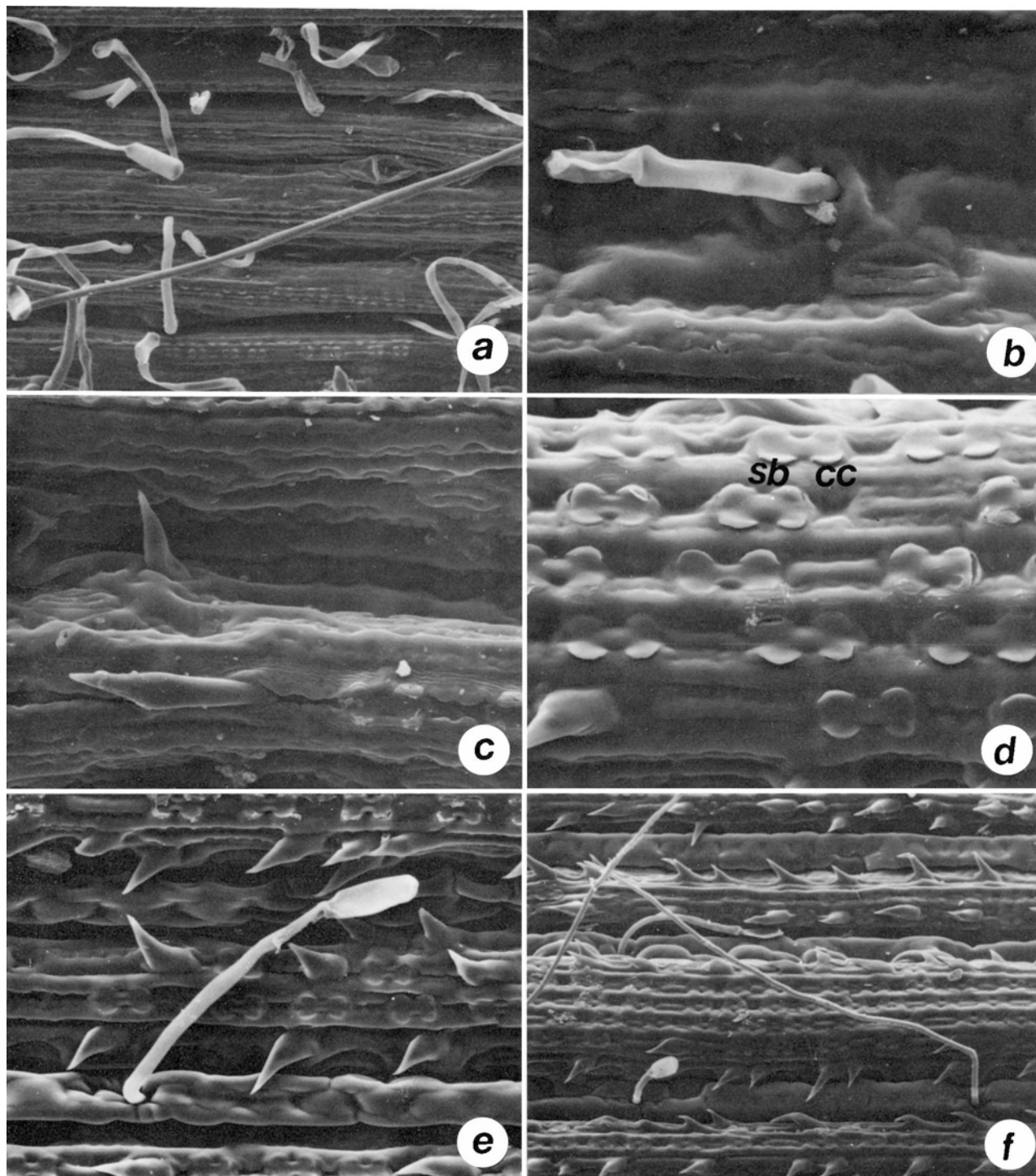


PLATE 8.—Adaxial epidermis *Schmidia pappophoroides*, Godfrey and Acocks SH-1641: *a*, overview, $\times 144$; *b*, stomata, interstomatal cell, microhair, $\times 768$; *c*, prickles, long cells, $\times 384$; *d*, costal silica bodies (sb), cork cells (cc), $\times 768$; *e*, microhair, $\times 416$; *f*, microhair, $\times 192$.

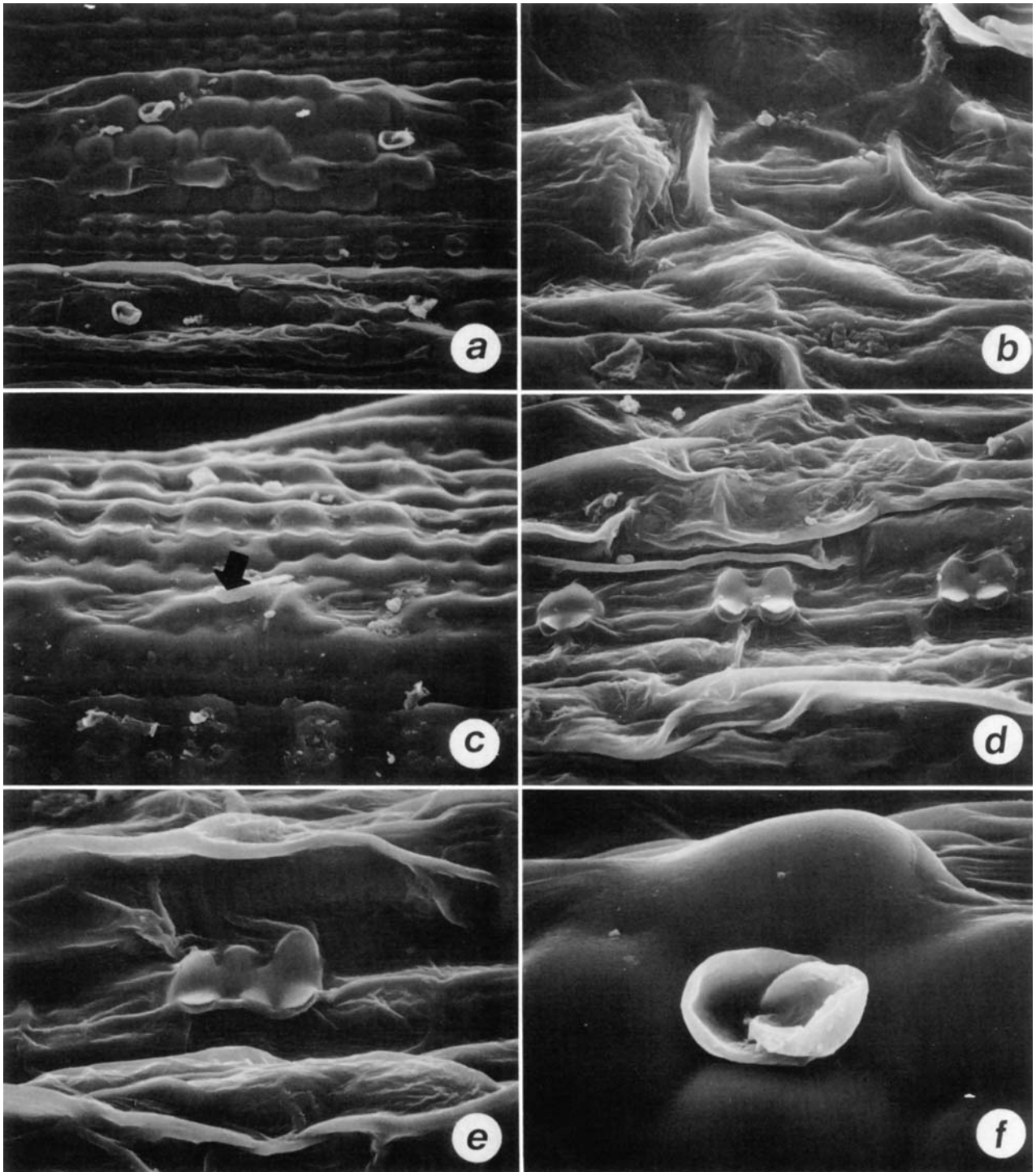


PLATE 9.—Abaxial epidermis *Acrachne racemosa*, Williams *s.n.*, April 20, 1947: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), long cells, costal silica bodies, $\times 867$; *d*, costal silica bodies, $\times 867$; *e*, intercostal silica body, $\times 1285$; *f*, microhair, $\times 1696$.

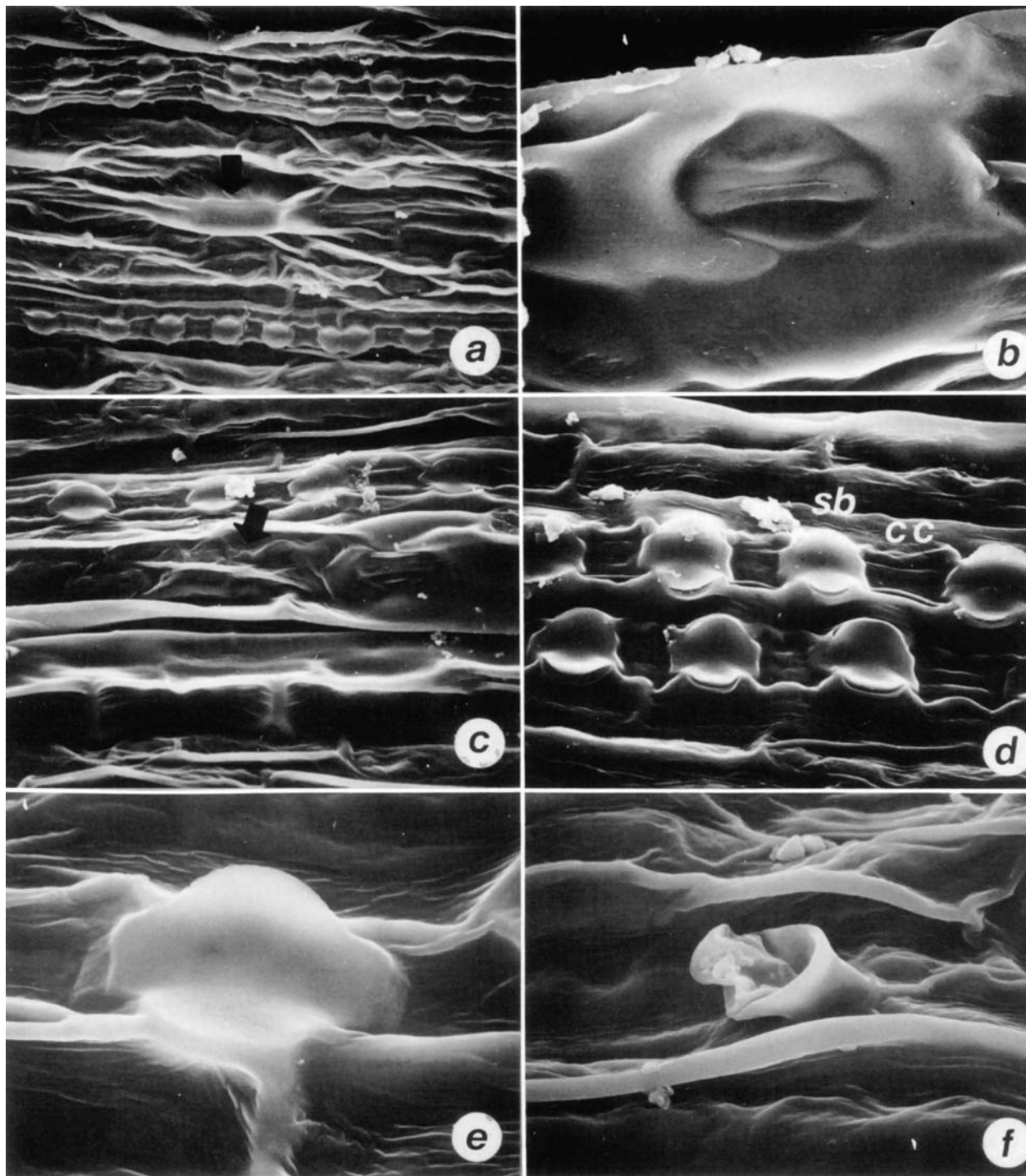


PLATE 10.—Adaxial epidermis *Acrachne racemosa*, Williams *s.n.*, April 20, 1947: *a*, overview, intercostal raised rectangular cell (arrow), $\times 416$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), long cells, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *e*, costal silica body, $\times 2970$; *f*, microhair, $\times 1696$.

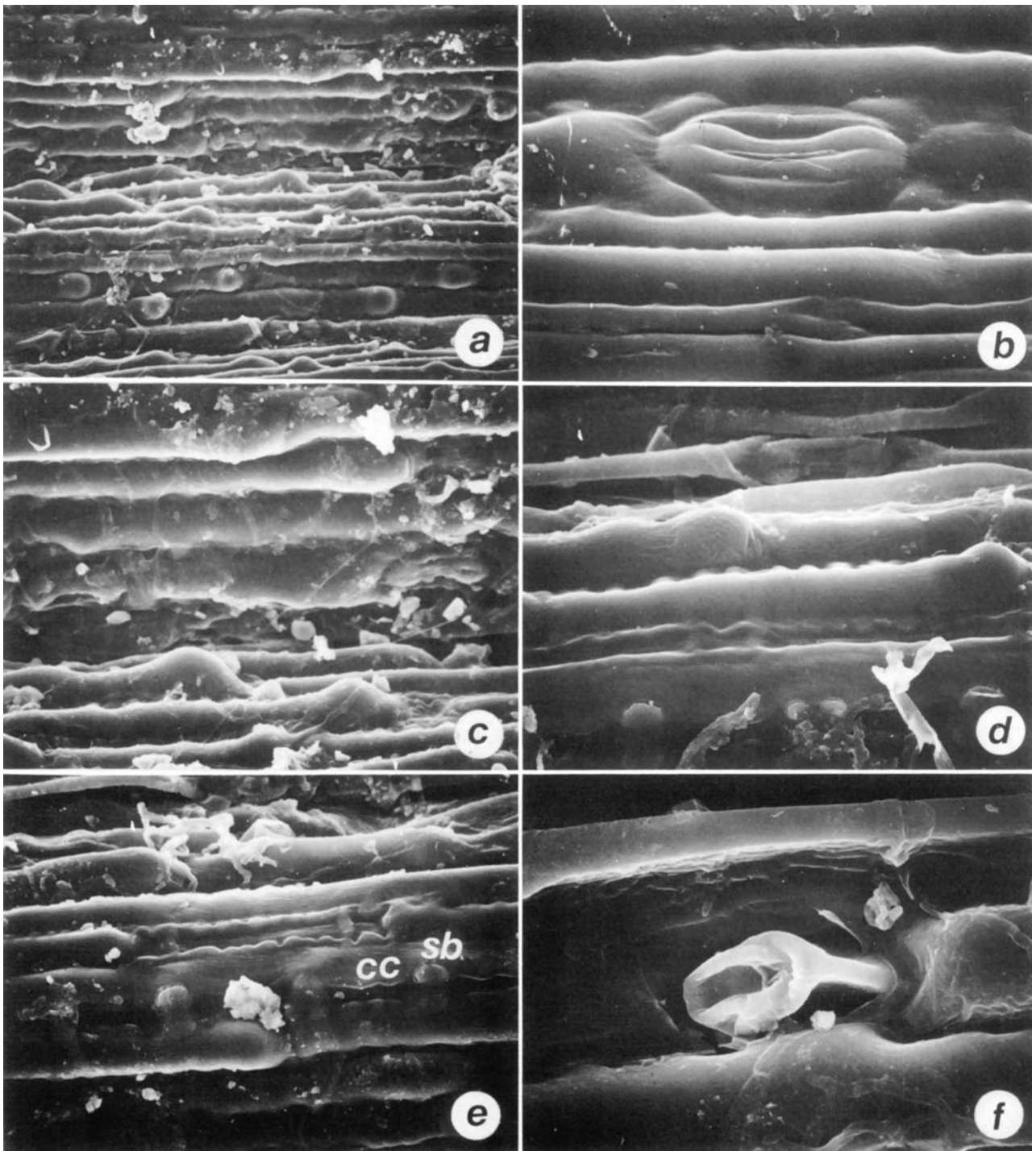


PLATE 11.—Abaxial epidermis *Apochiton burttii*, Greenway and Polhill 11513: *a*, overview, $\times 295$; *b*, stoma, long cells, $\times 1696$; *c*, interstomatal cell, long cells, $\times 625$; *d*, long cells, $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 625$; *f*, microhair, $\times 1696$.

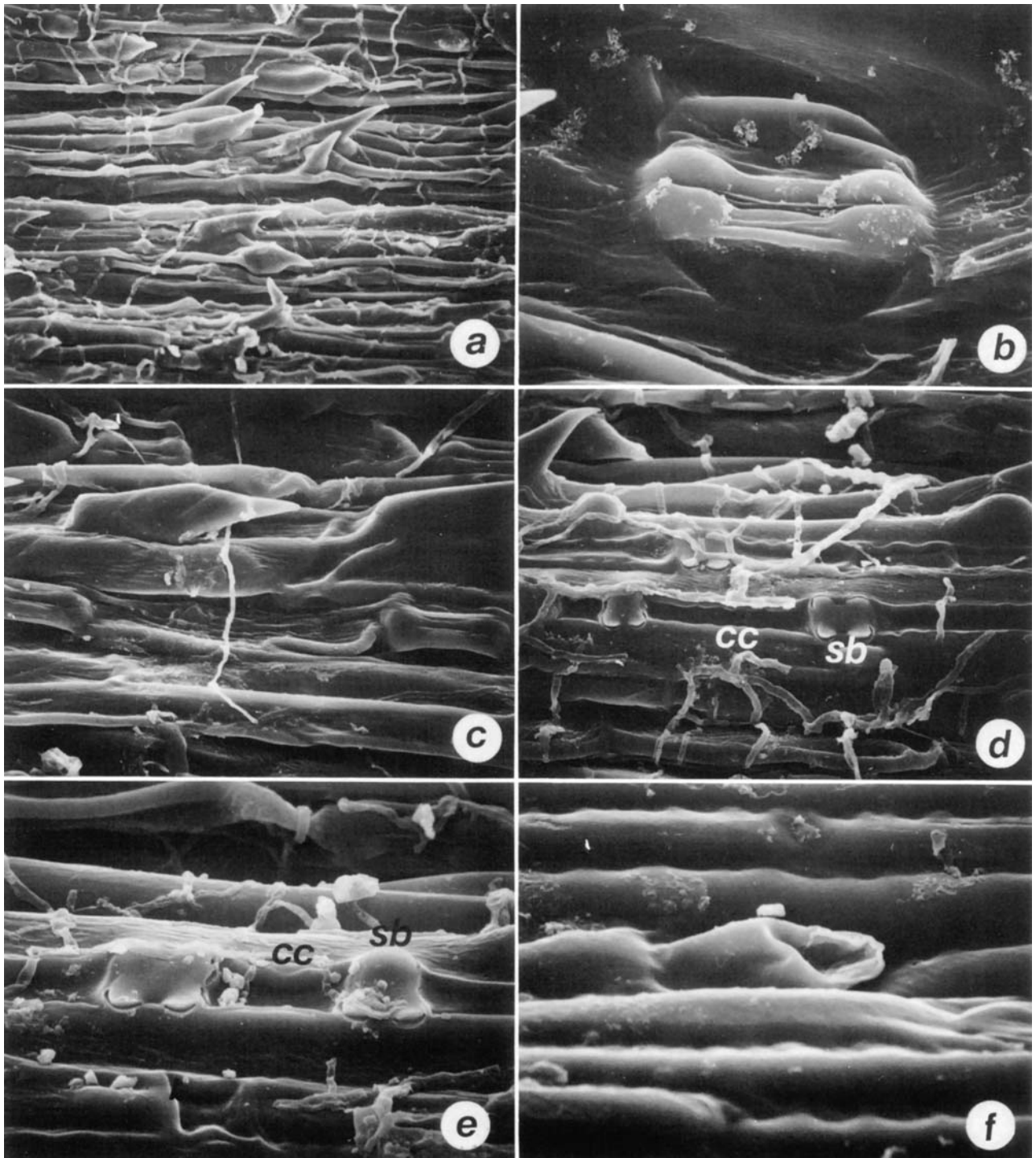


PLATE 12.—Adaxial epidermis *Apochiton burttii*, Greenway and Polhill 11513: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, microhair, $\times 1696$.

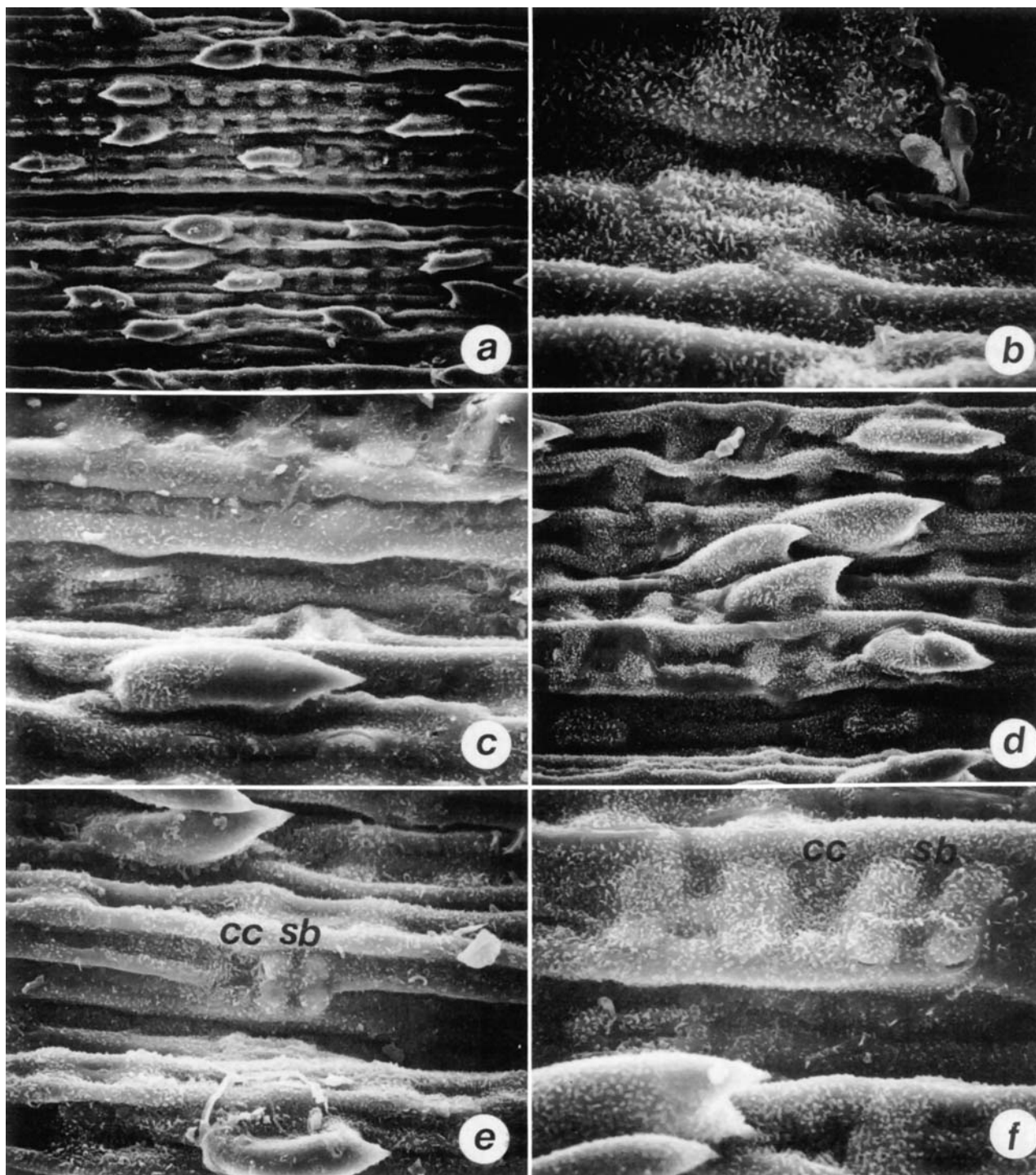


PLATE 13.—Abaxial epidermis *Bewsia biflora*, Davidse 6471: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 960$; *d*, costal prickles, $\times 625$; *e*, intercostal silica body (sb), cork cell (cc), $\times 867$; *f*, costal silica bodies (sb), cork cell (cc), $\times 1285$.

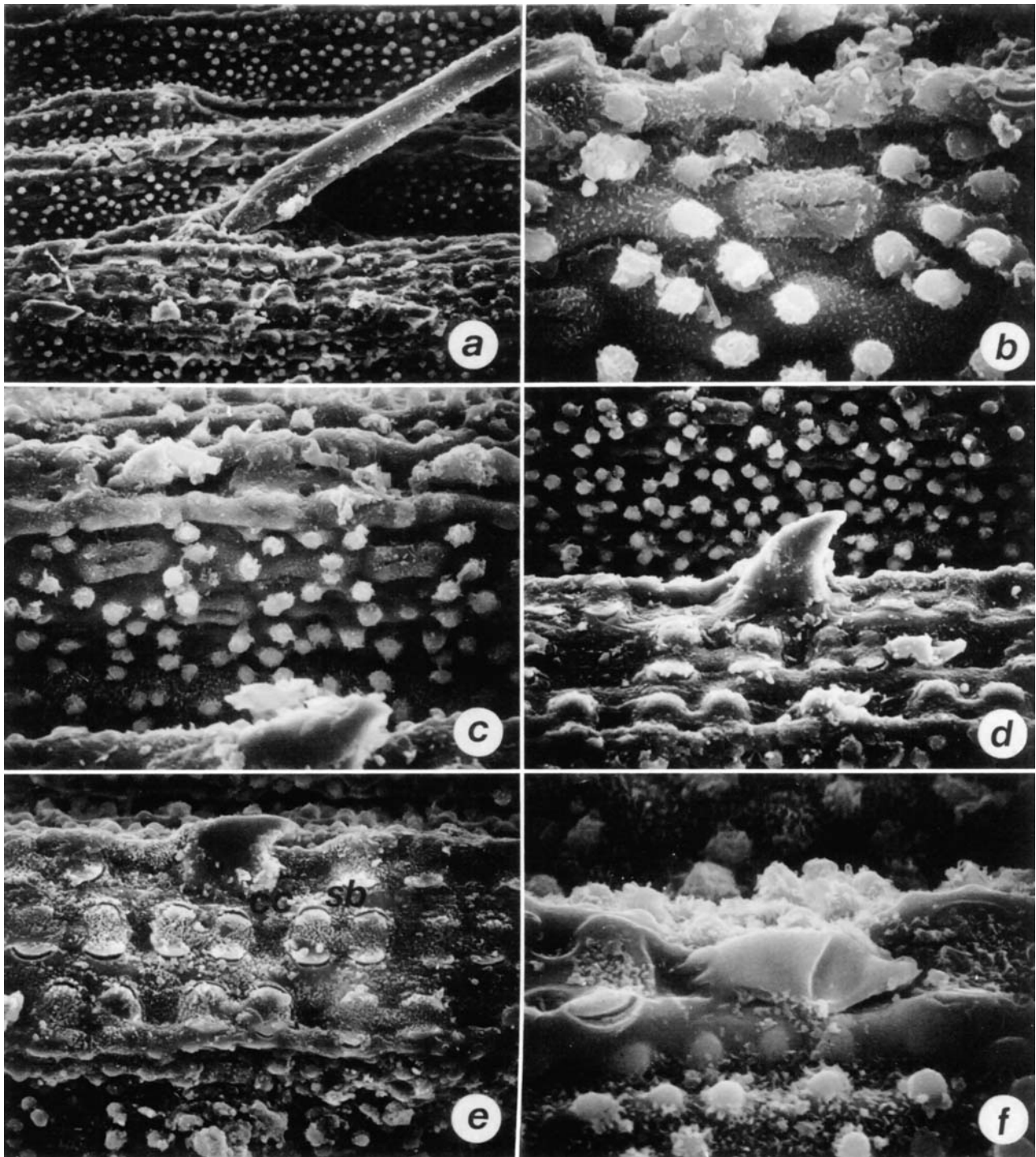


PLATE 14.—Adaxial epidermis *Bewsia biflora*, Davidse 6471: *a*, overview, base of macrohair, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, $\times 867$; *d*, costal prickle, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 625$; *f*, microhair, $\times 1696$.

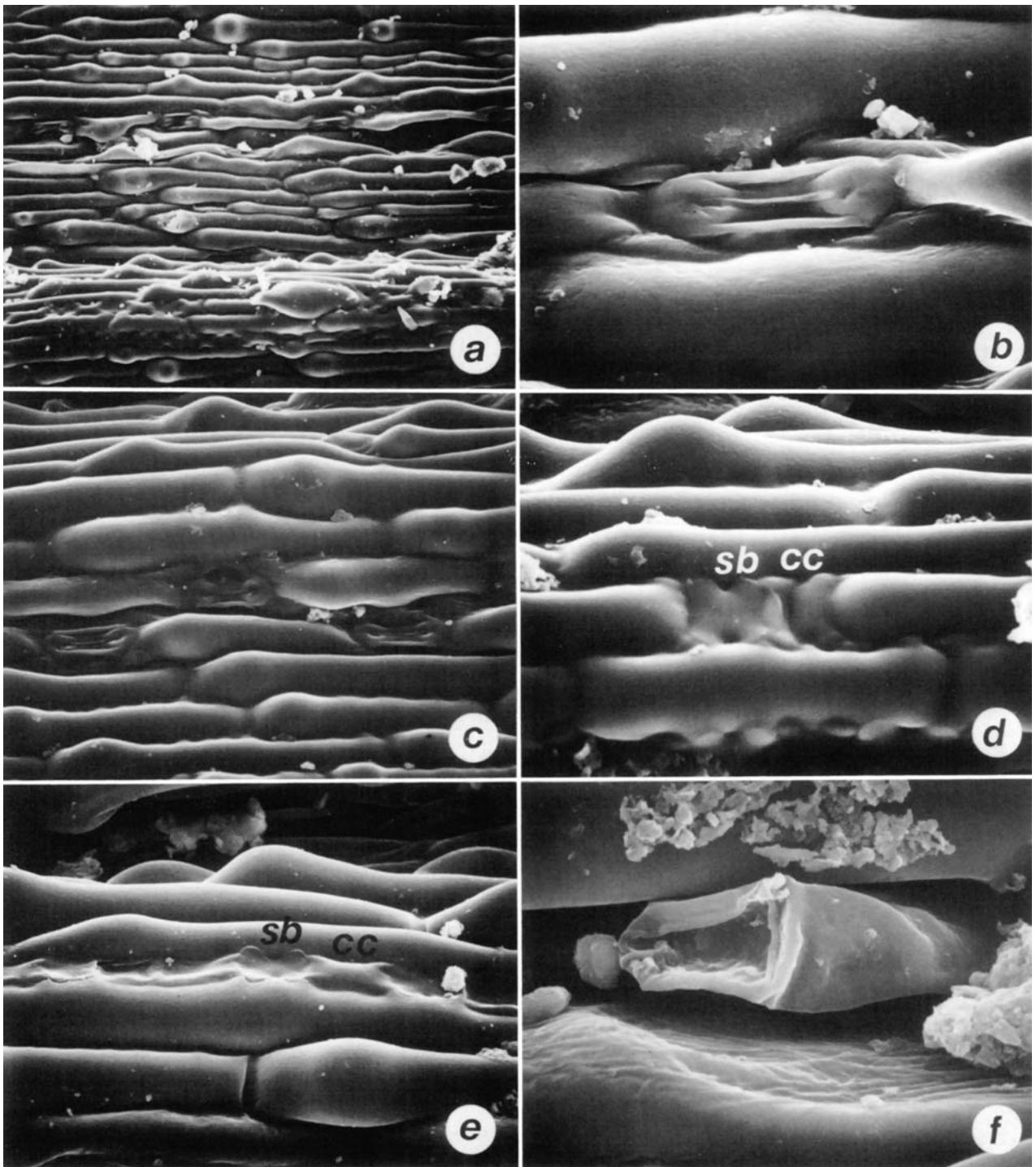


PLATE 15.—Abaxial epidermis *Coelachyrum longiglume*, Senyimba 365: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, $\times 625$; *d*, long cells, silica body (sb), cork cell (?) (cc), $\times 1285$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 2970$.

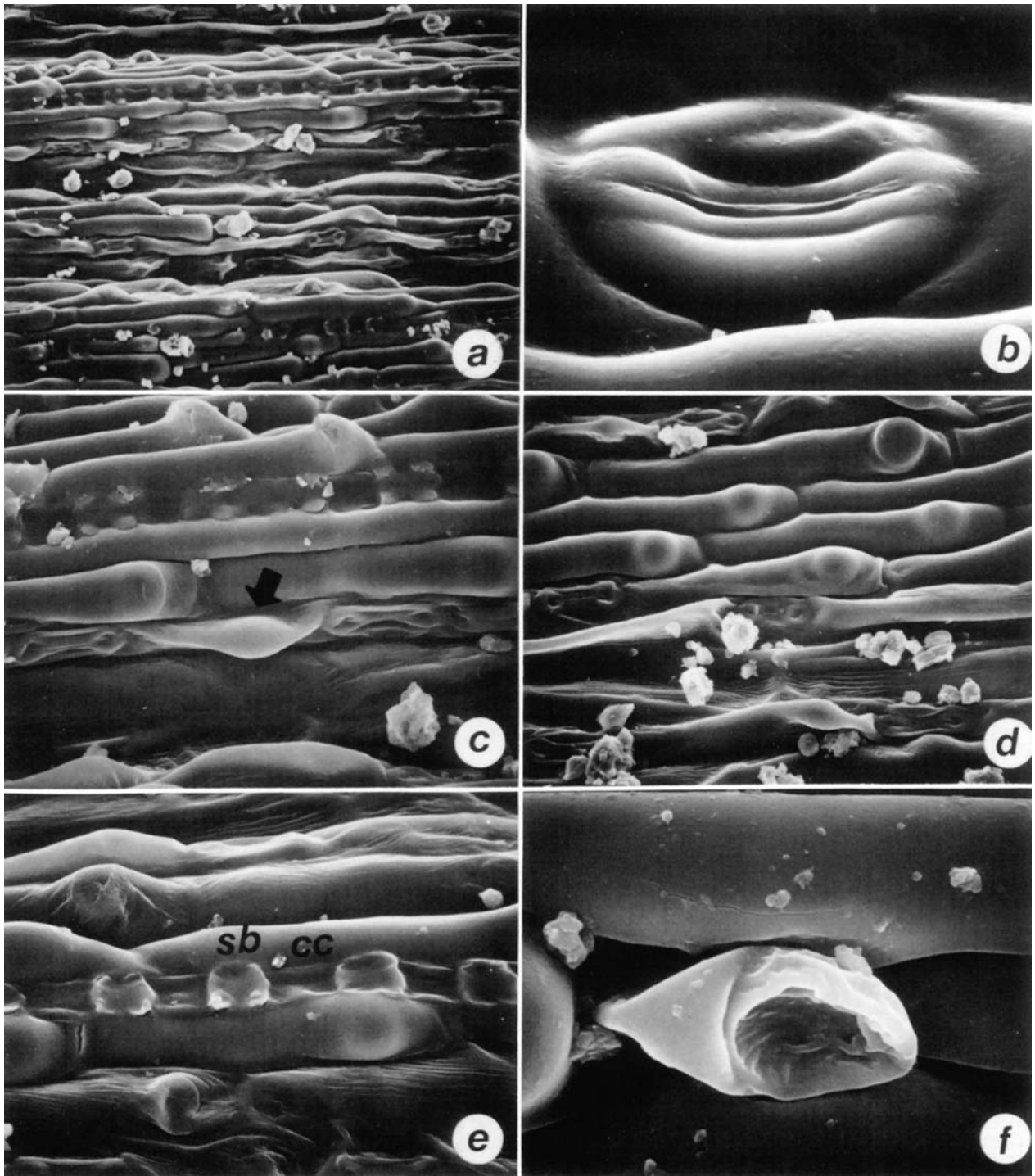


PLATE 16.—Adaxial epidermis *Coelachyrum longiglume*, Senyimba 365: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cell (arrow), $\times 867$; *d*, long cells, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 2970$.

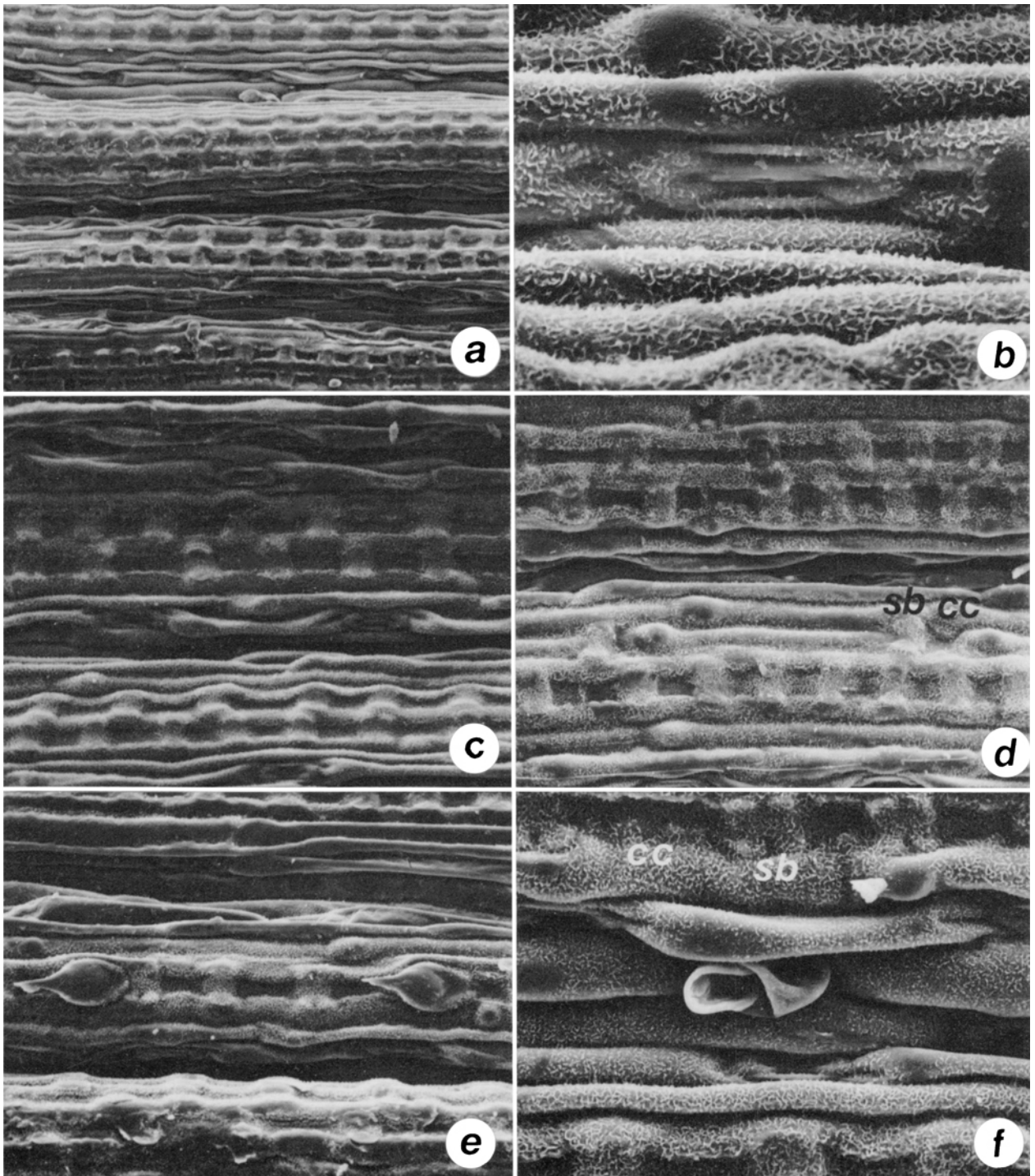


PLATE 17.—Abaxial epidermis *Cypholepis yemenica*, Glover and Gilland 745: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, $\times 320$; *d*, long cells, intercostal silica bodies (sb), cork cells (cc), $\times 320$; *e*, costal prickles, $\times 320$; *f*, microhair, costal silica bodies (sb), cork cells (cc), $\times 640$.

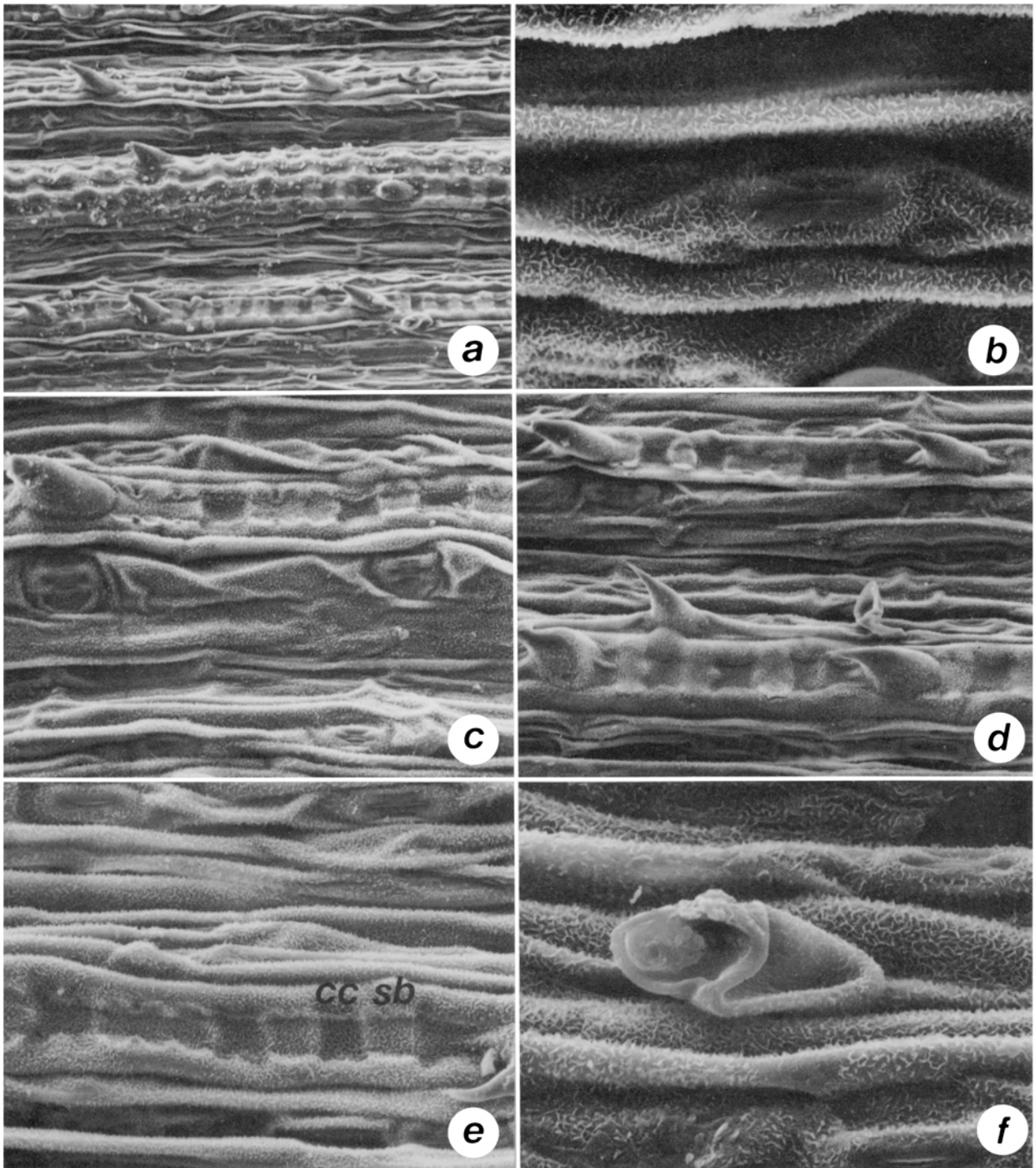


PLATE 18.—Adaxial epidermis *Cypholepis yemenica*, Glover and Gilland 745: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, $\times 480$; *d*, prickles, $\times 320$; *e*, costal silica bodies (sb), cork cells (cc), $\times 640$; *f*, microhair, $\times 1250$.

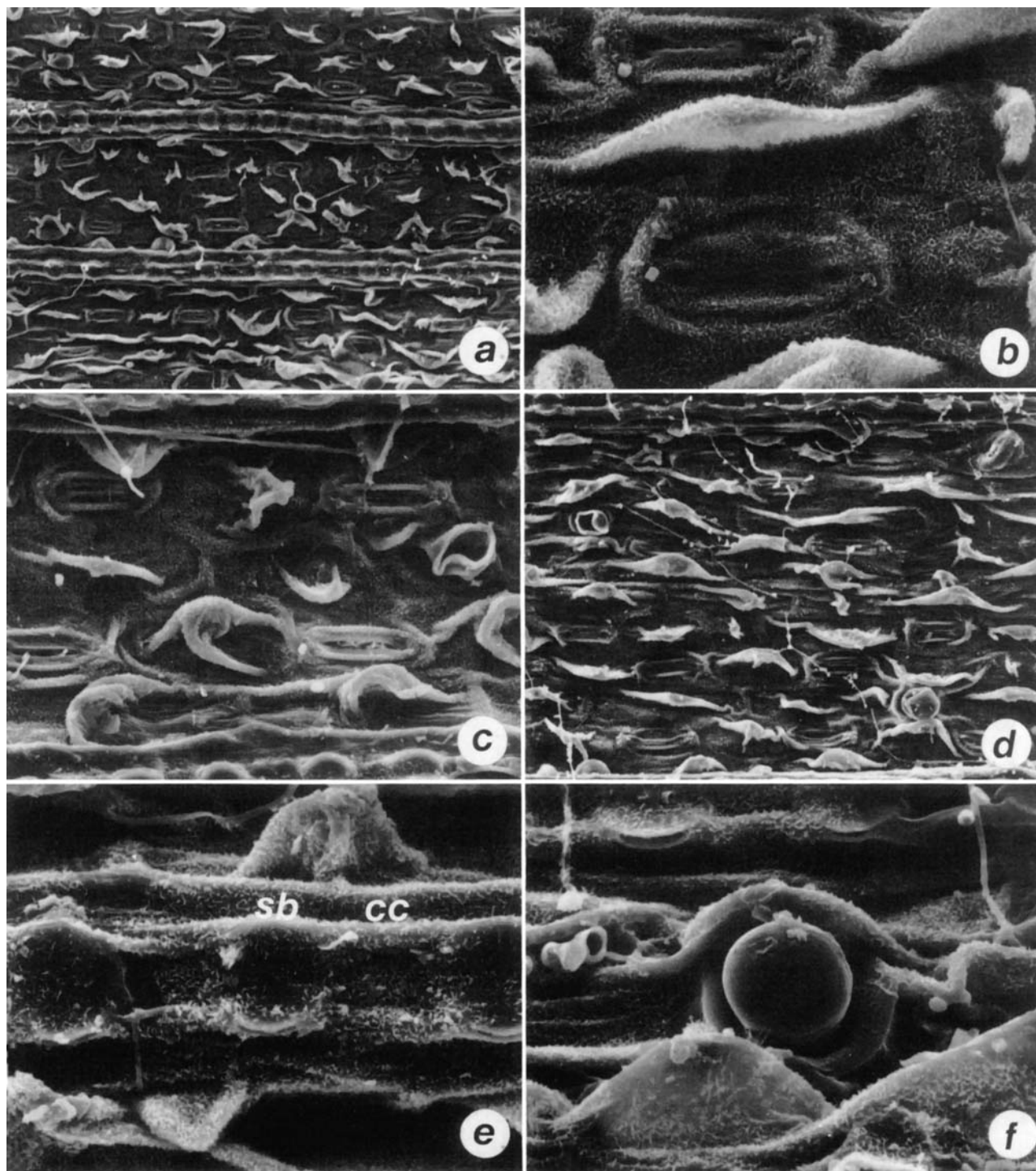


PLATE 19.—Abaxial epidermis *Dactyloctenium giganteum*, Bullock 305: *a*, overview, $\times 208$; *b*, stomata, $\times 1250$; *c*, interstomatal cells, $\times 640$; *d*, long cells, $\times 320$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1250$; *f*, microhair, $\times 1250$.

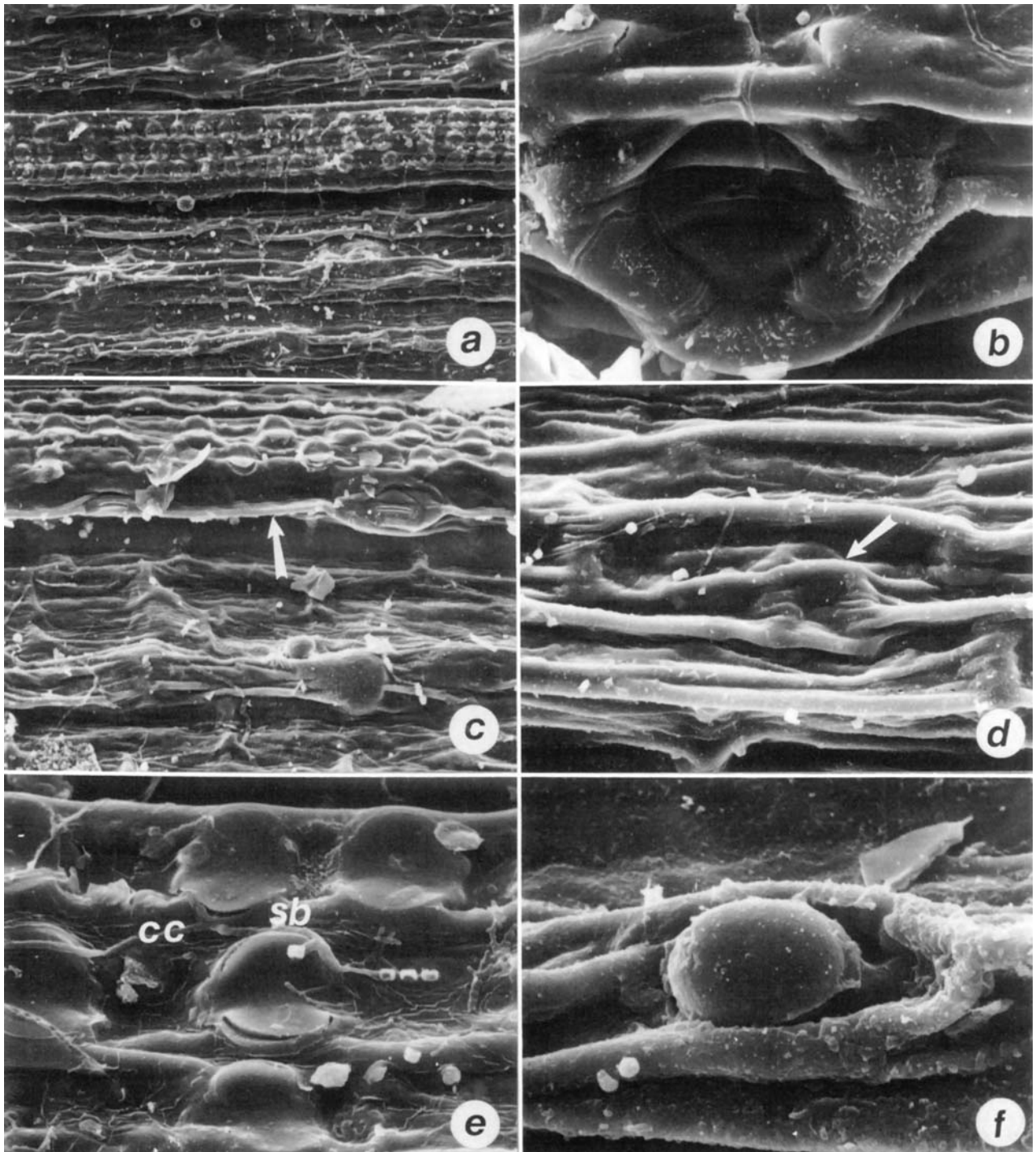


PLATE 20.—Adaxial epidermis *Dactyloctenium giganteum*, Bullock 305: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cell (arrow), long cells, $\times 320$; *d*, intercostal cork cell (arrow), long cells, $\times 960$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1250$; *f*, microhair, $\times 1875$.

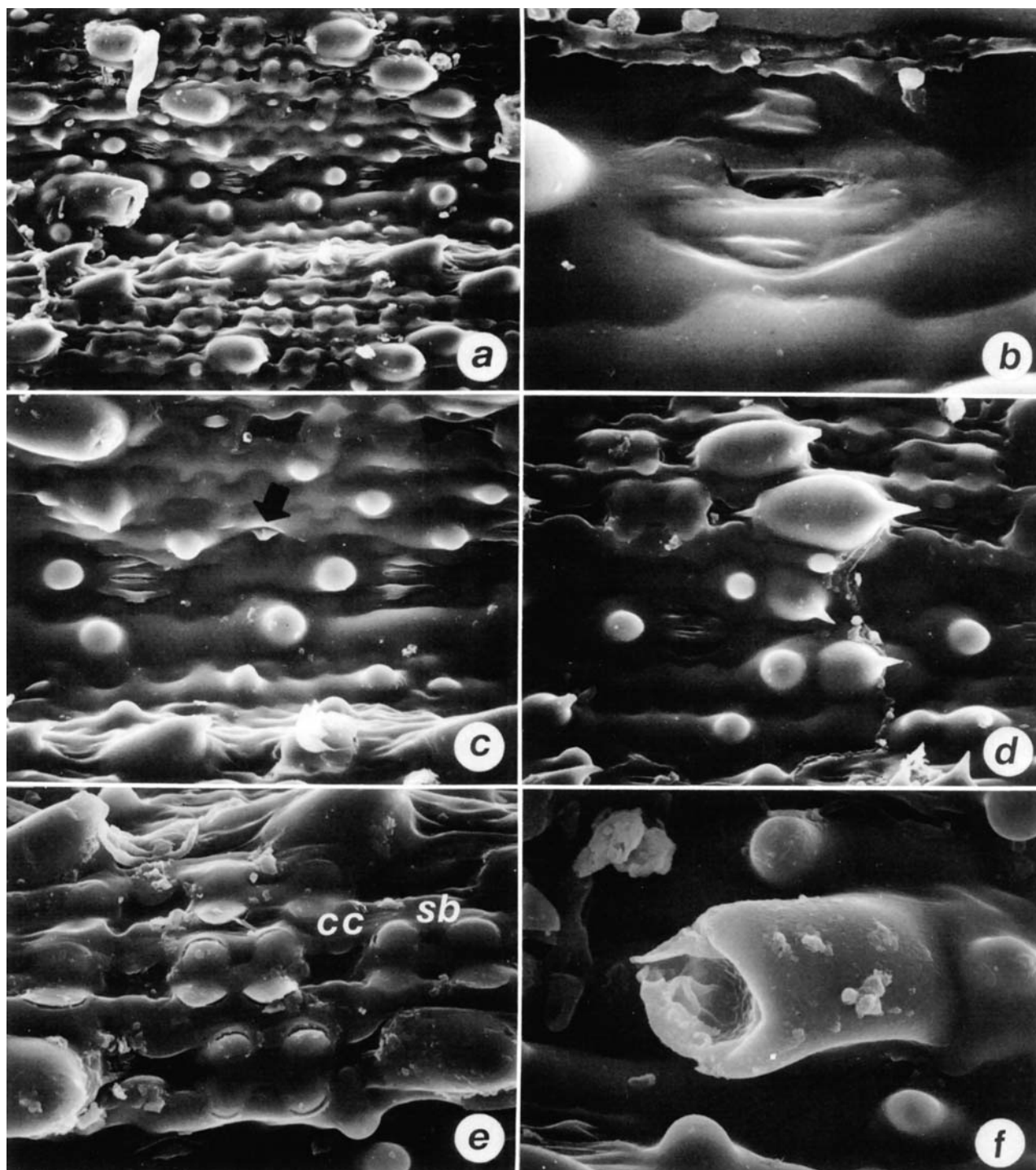


PLATE 21.—Abaxial epidermis *Dinebra retroflexa*, Bullock 302: *a*, overview, $\times 416$; *b*, stoma, $\times 2970$; *c*, interstomatal cell, long cells, intercostal cork cell (arrow), $\times 867$; *d*, costal prickles, intercostal hooks, $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, microhair, $\times 1696$.

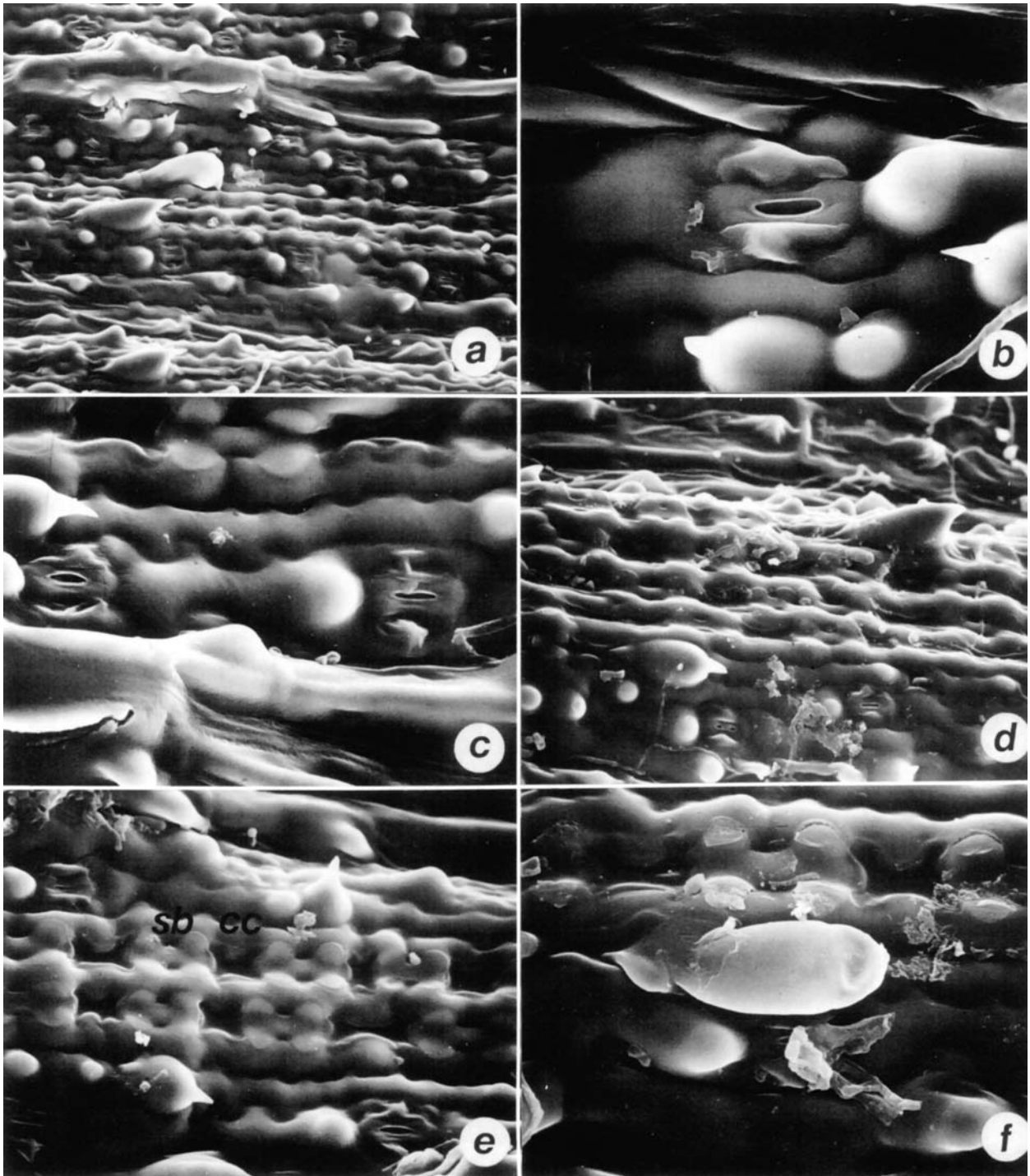


PLATE 22.—Adaxial epidermis *Dinebra retroflexa*, Bullock 302: *a*, overview, $\times 416$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 1285$; *d*, costal prickle, intercostal hook, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

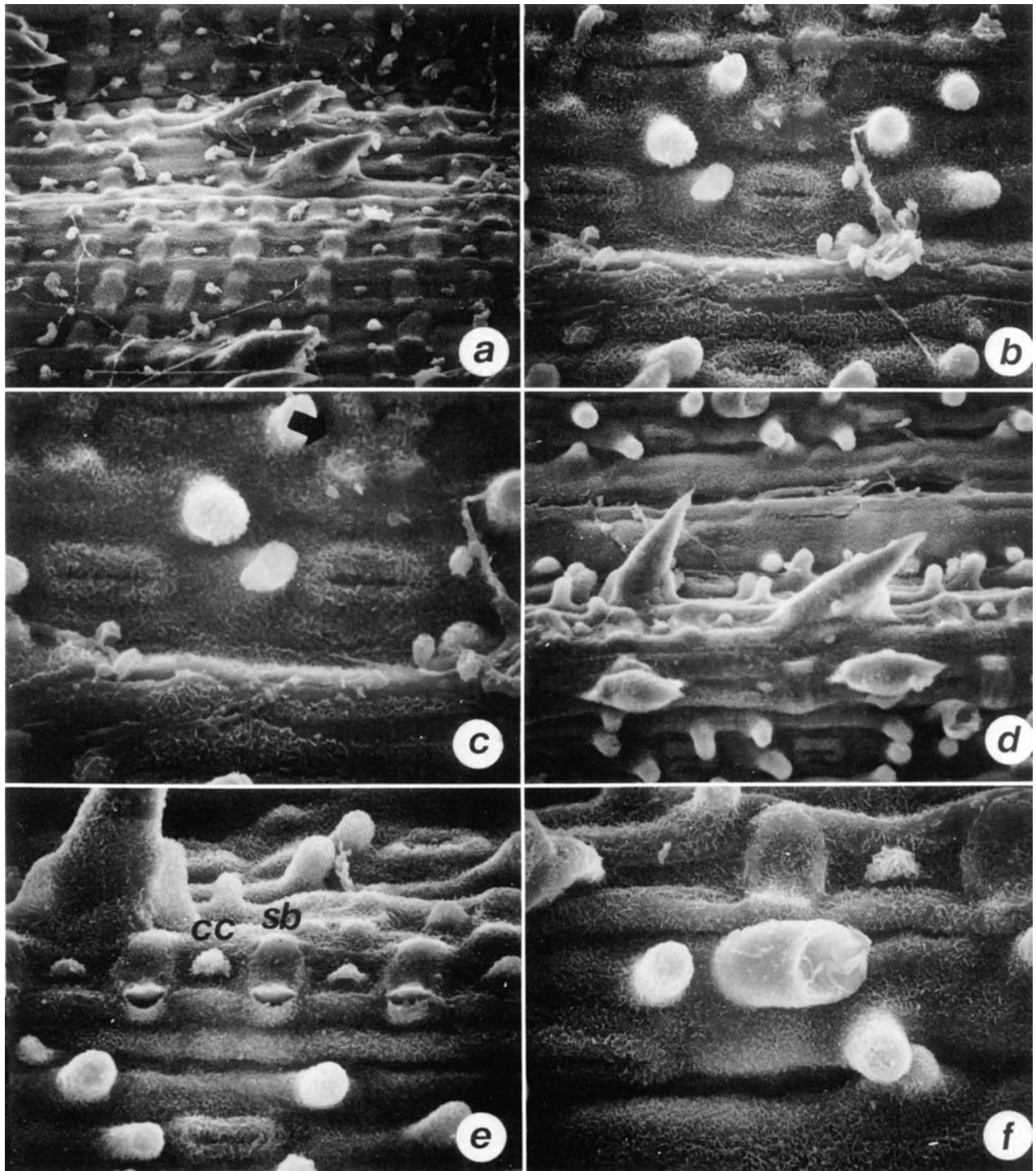


PLATE 23.—Abaxial epidermis *Diplachne fusca*, Siame 596: *a*, overview, $\times 416$; *b*, stomata, $\times 1285$; *c*, interstomatal cell, intercostal silica bodies (arrow), $\times 1696$; *d*, costal prickles, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, microhair, $\times 1696$.

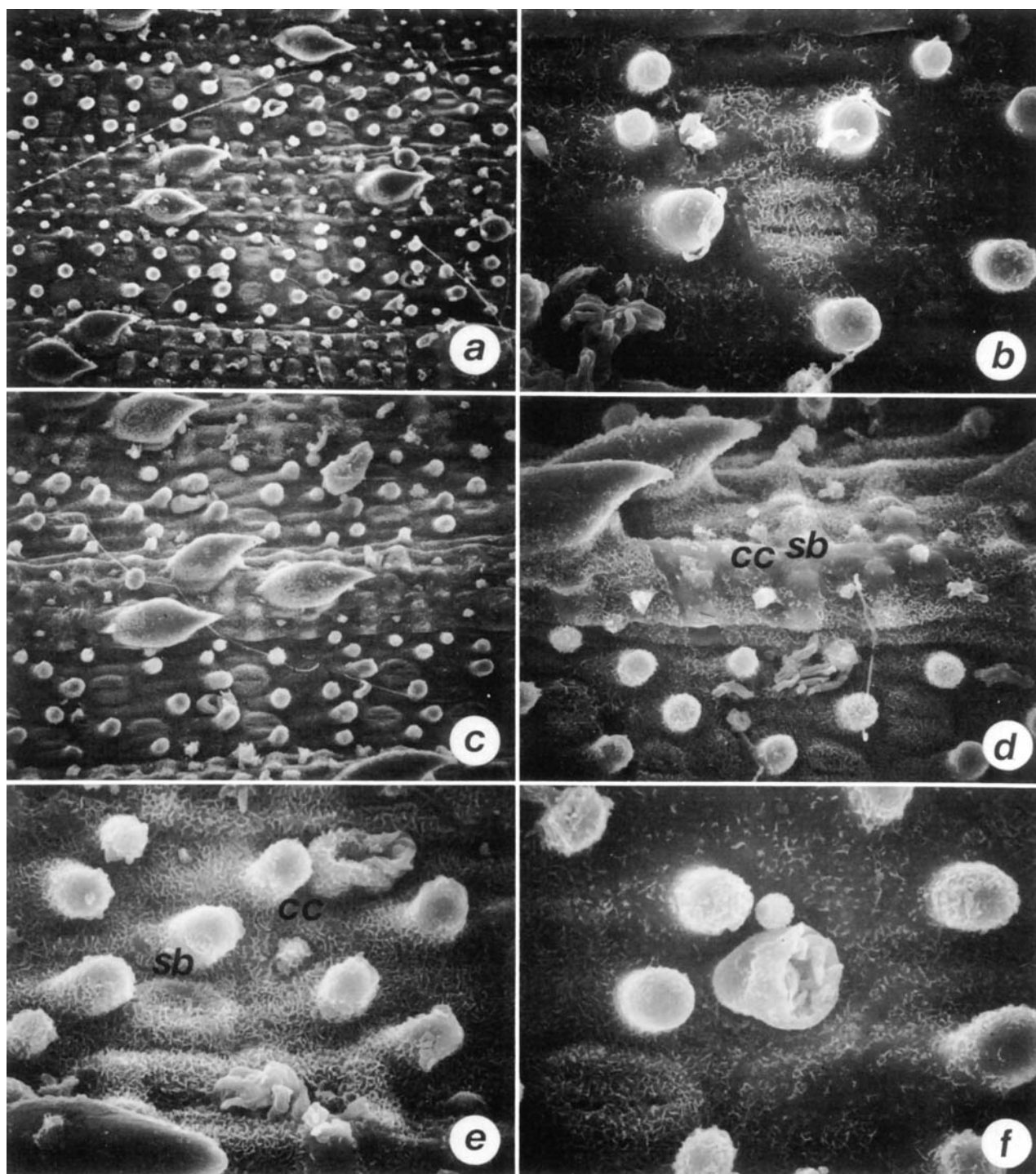


PLATE 24.—Adaxial epidermis *Diplachne fusca*, Siame 596: *a*, overview, $\times 295$; *b*, stoma, $\times 1285$; *c*, costal prickles, $\times 416$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, intercostal silica body (sb), cork cell (cc), $\times 1285$; *f*, microhair, $\times 1696$.

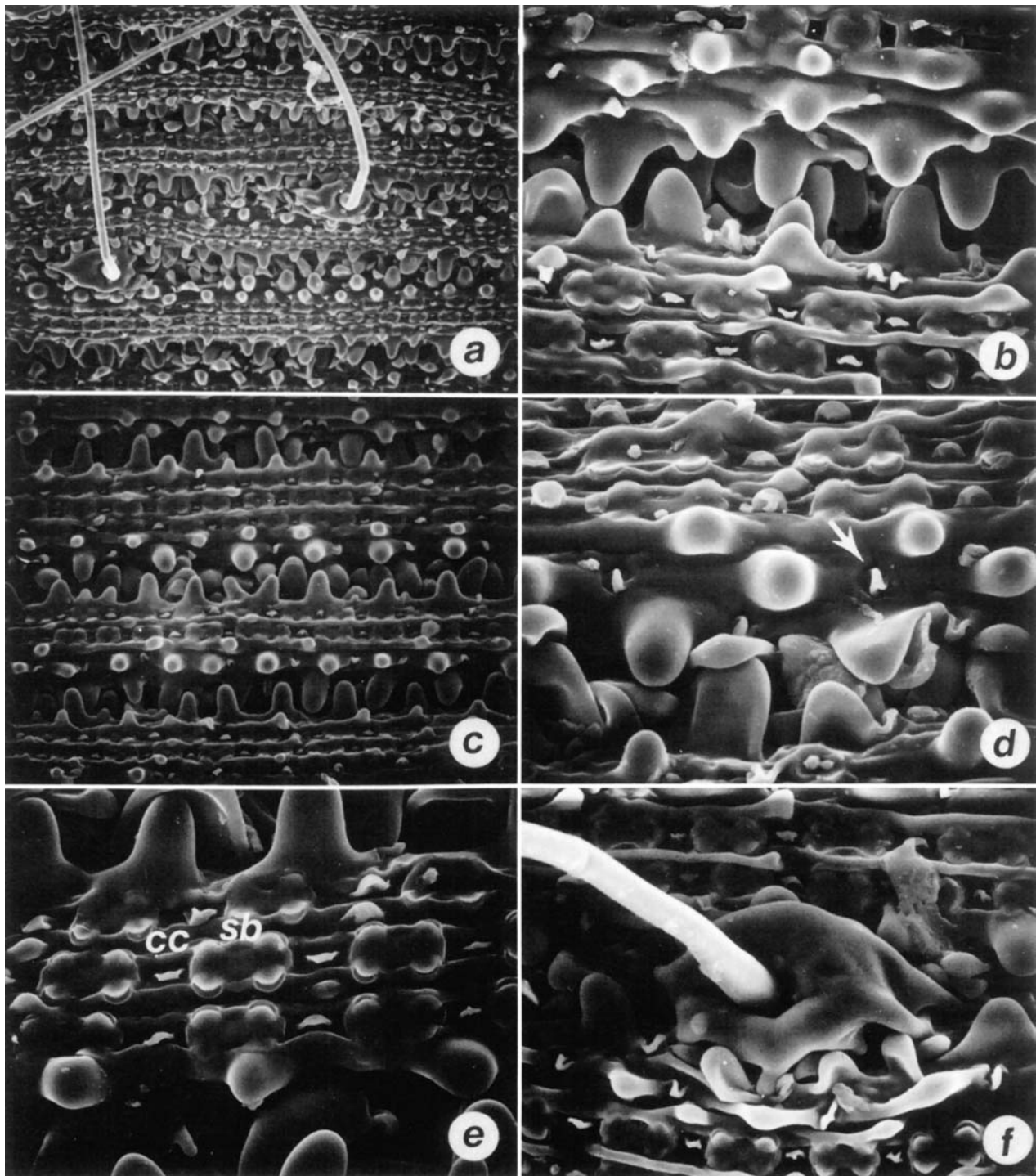


PLATE 25.—Abaxial epidermis *Drake-Brockmania haareri*, Drummond and Hemsley 2287: *a*, overview, $\times 161$; *b*, grooved intercostal zone with overarching papillae, $\times 625$; *c*, costal and intercostal zone, $\times 295$; *d*, long cells, intercostal cork cells (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, base of macrohair, $\times 625$.

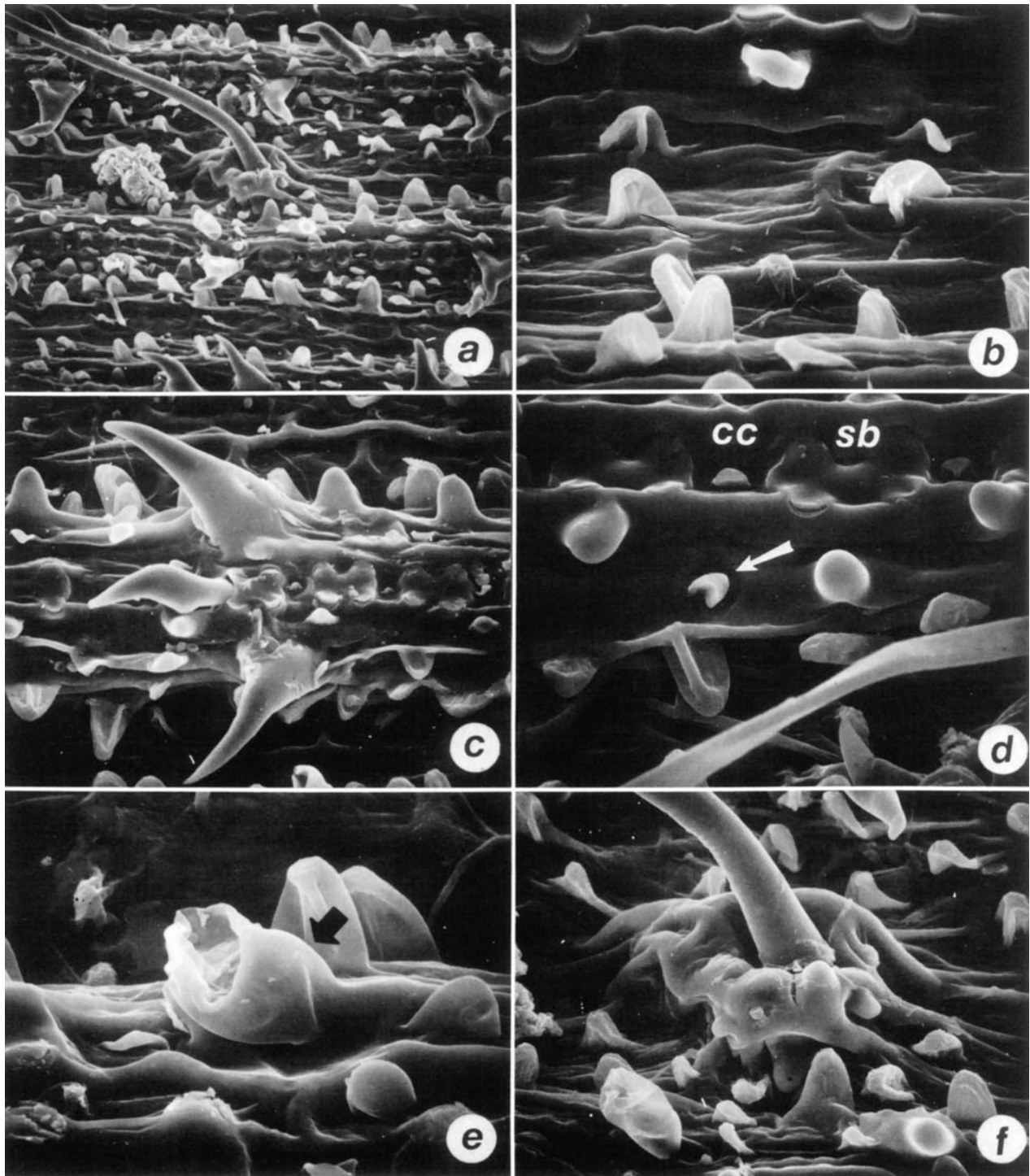


PLATE 26.—Adaxial epidermis *Drake-Brockmania haareri*, Drummond and Hemsley 2287: *a*, overview, $\times 295$; *b*, papillate long cells, $\times 1285$; *c*, costal prickles, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), intercostal cork cell (arrow), $\times 1285$; *e*, microhair (arrow), $\times 1696$; *f*, base of macrohair, $\times 867$.

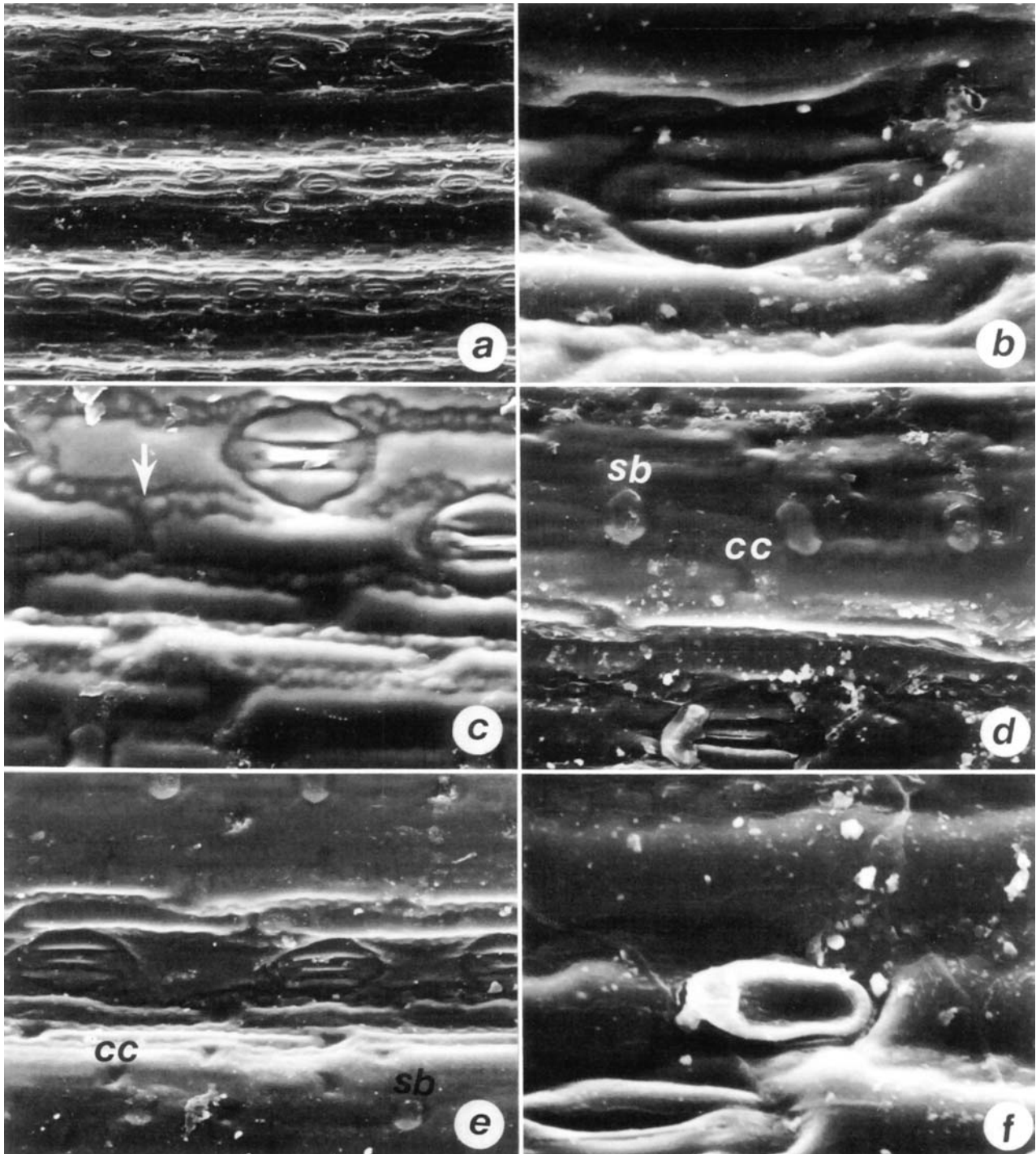


PLATE 27.—Abaxial epidermis *Eleusine floccifolia*, Westphal and Westphal-Stevens 1572: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, intercostal cork cells (arrow), interstomatal cells, long cells, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, stomata, costal silica bodies (sb), cork cells (cc), $\times 480$; *f*, microhair, $\times 1250$.

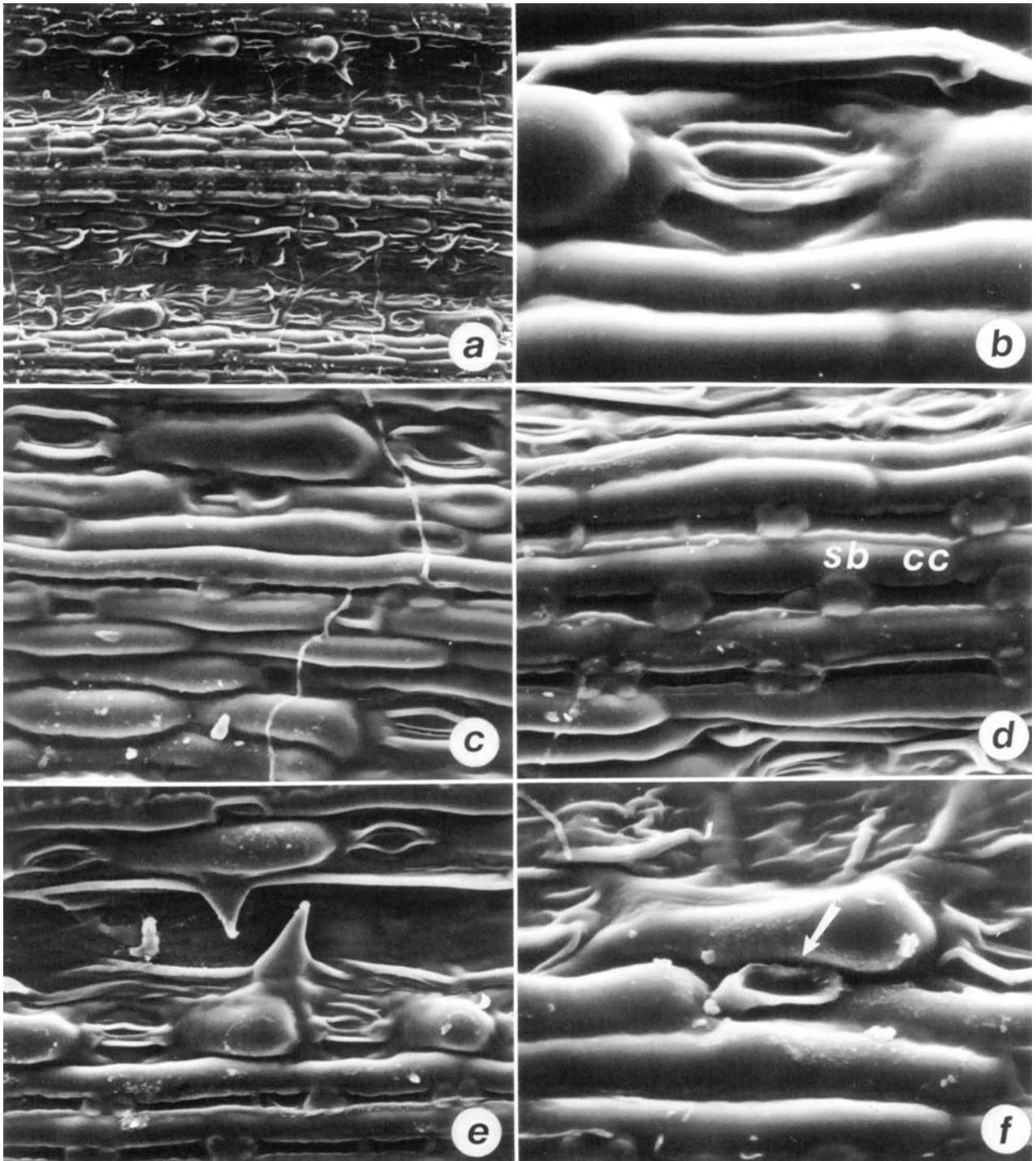


PLATE 28.—Adaxial epidermis *Eleusine floccifolia*, Westphal and Westphal-Stevens 1572: *a*, overview, $\times 192$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, intercostal prickles, interstomatal cells, $\times 480$; *f*, microhair (arrow), $\times 832$.

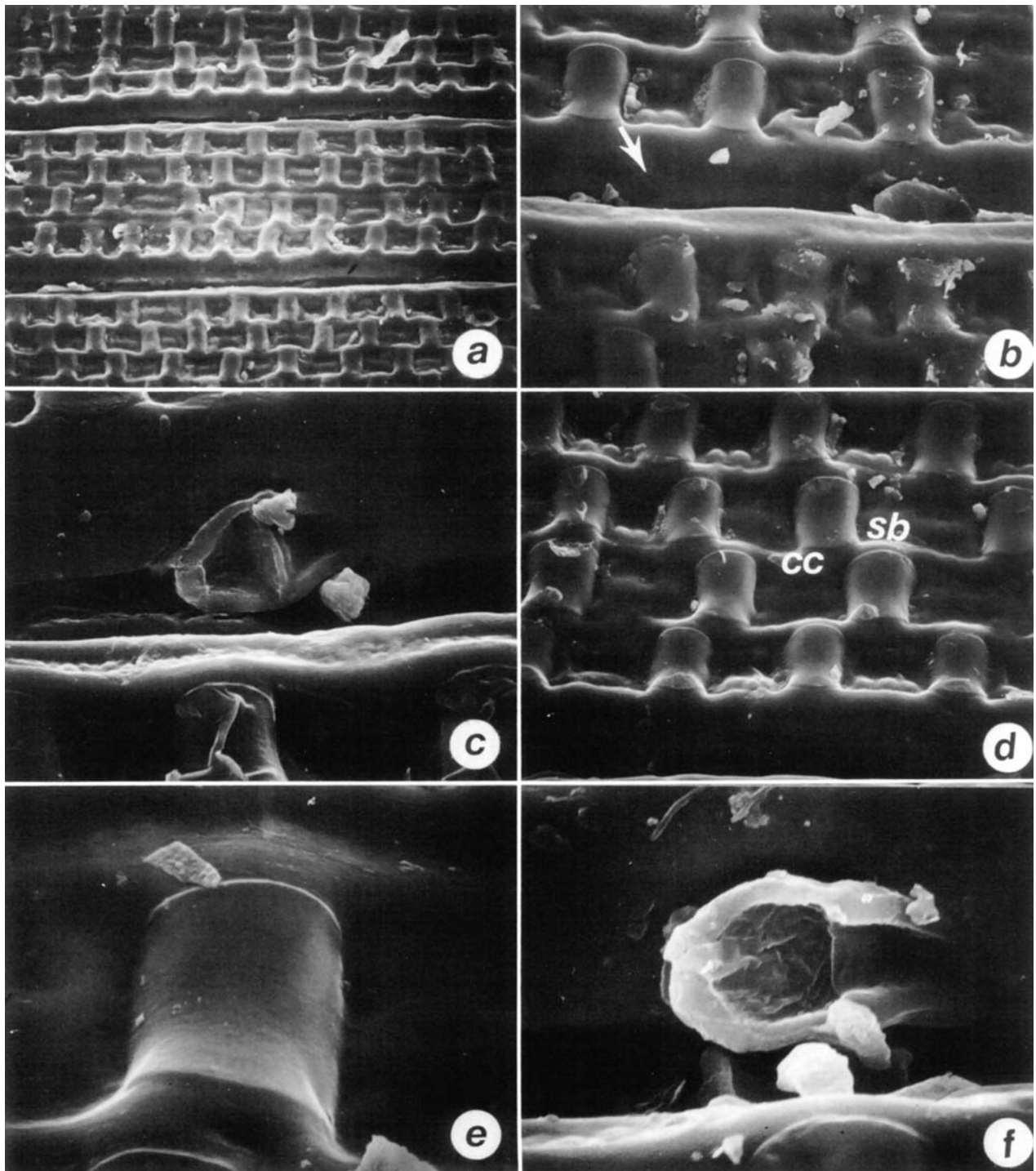


PLATE 29.—Abaxial epidermis *Eragrostiella bifaria*, Faden 74/967: *a*, overview, $\times 295$; *b*, narrow, grooved intercostal zone (arrow), $\times 867$; *c*, long cells, microhair, $\times 1696$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, costal silica body, $\times 2970$; *f*, microhair, $\times 2970$.

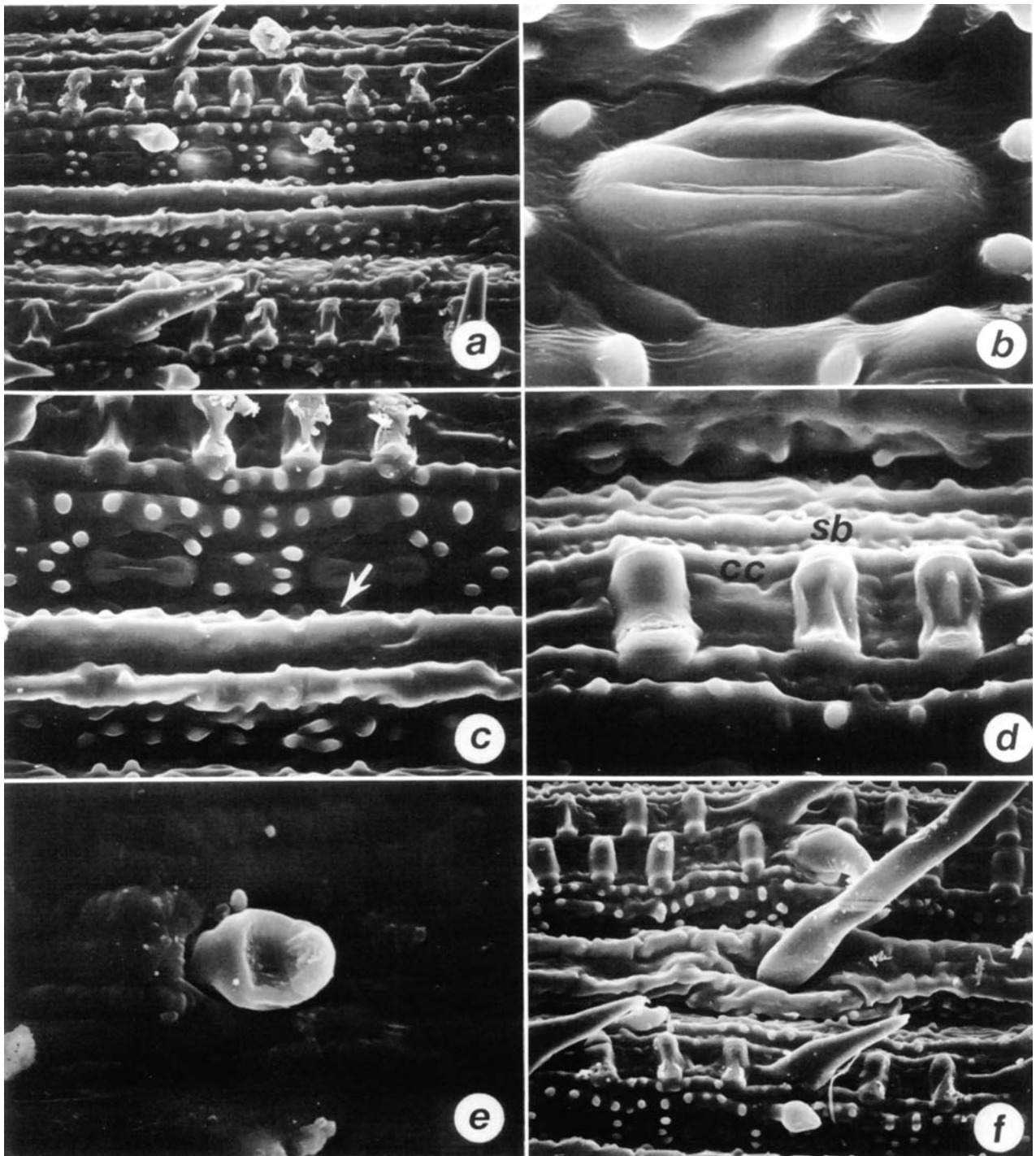


PLATE 30.—Adaxial epidermis *Eragrostiella bifaria*, Faden 74/967: *a*, overview, $\times 416$; *b*, stoma, $\times 2970$; *c*, interstomatal cell, long cells, mid-intercostal ridge (arrow), $\times 867$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *e*, microhair, $\times 1696$; *f*, macrohair, costal prickles, $\times 416$.

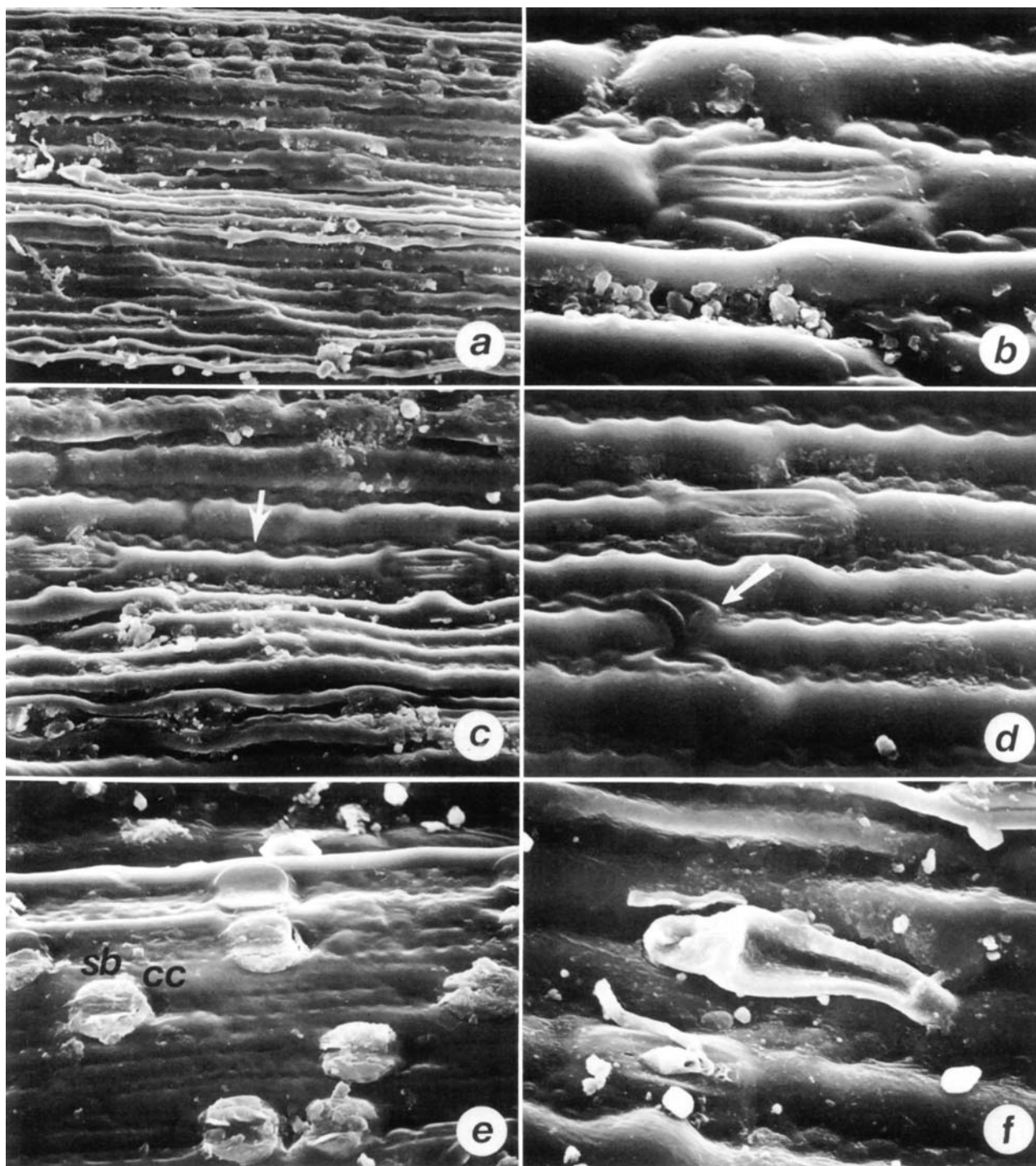


PLATE 31.—Abaxial epidermis *Eragrostis macilentia*, Kabuye 364: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), long cells, $\times 625$; *d*, long cells, stoma, intercostal cork cell (arrow), $\times 1285$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

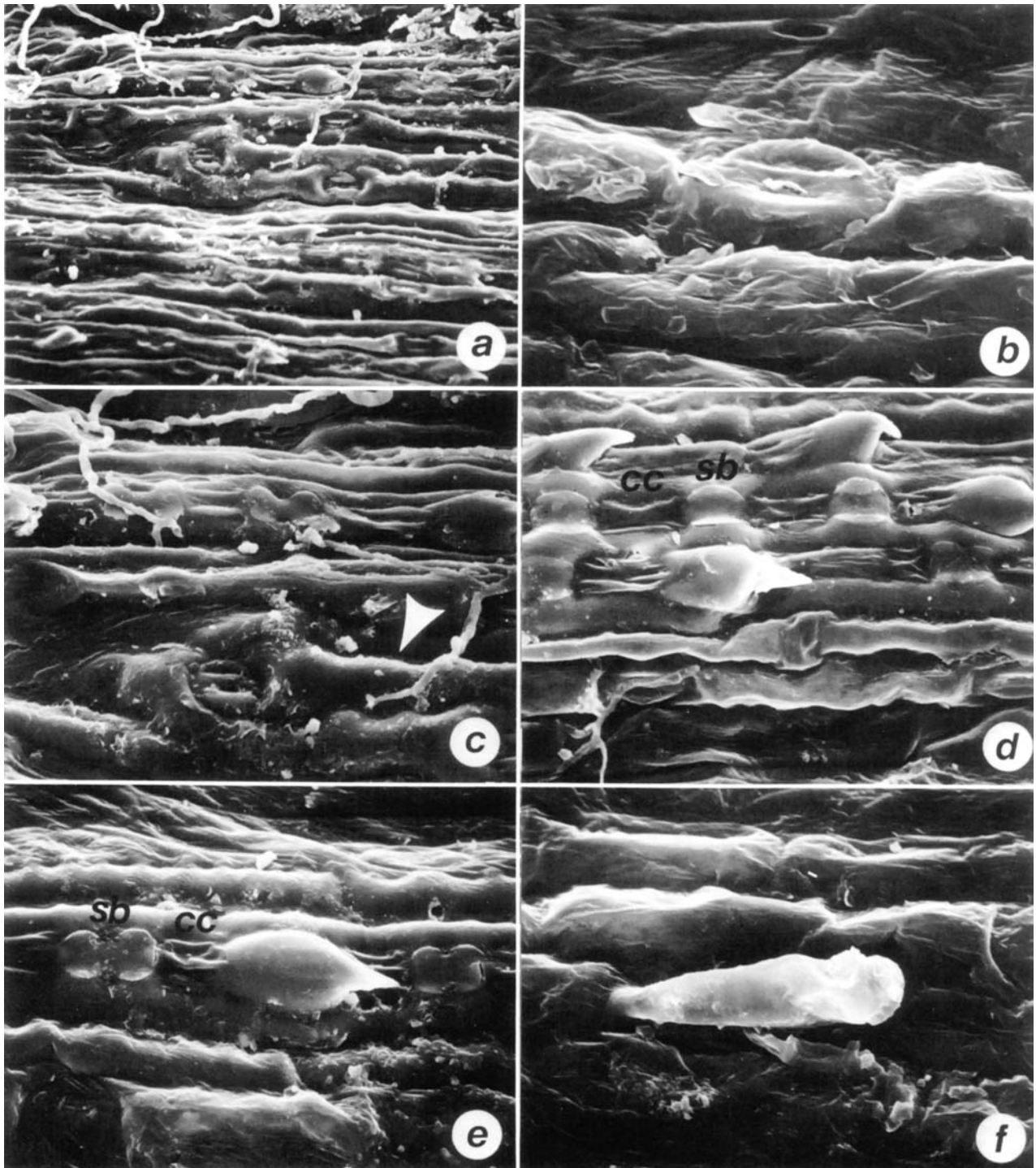


PLATE 32.—Adaxial epidermis *Eragrostis macilenta*, Kabuye 364: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), stoma, $\times 625$; *d*, costal prickles, silica bodies (sb), cork cells (cc), $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

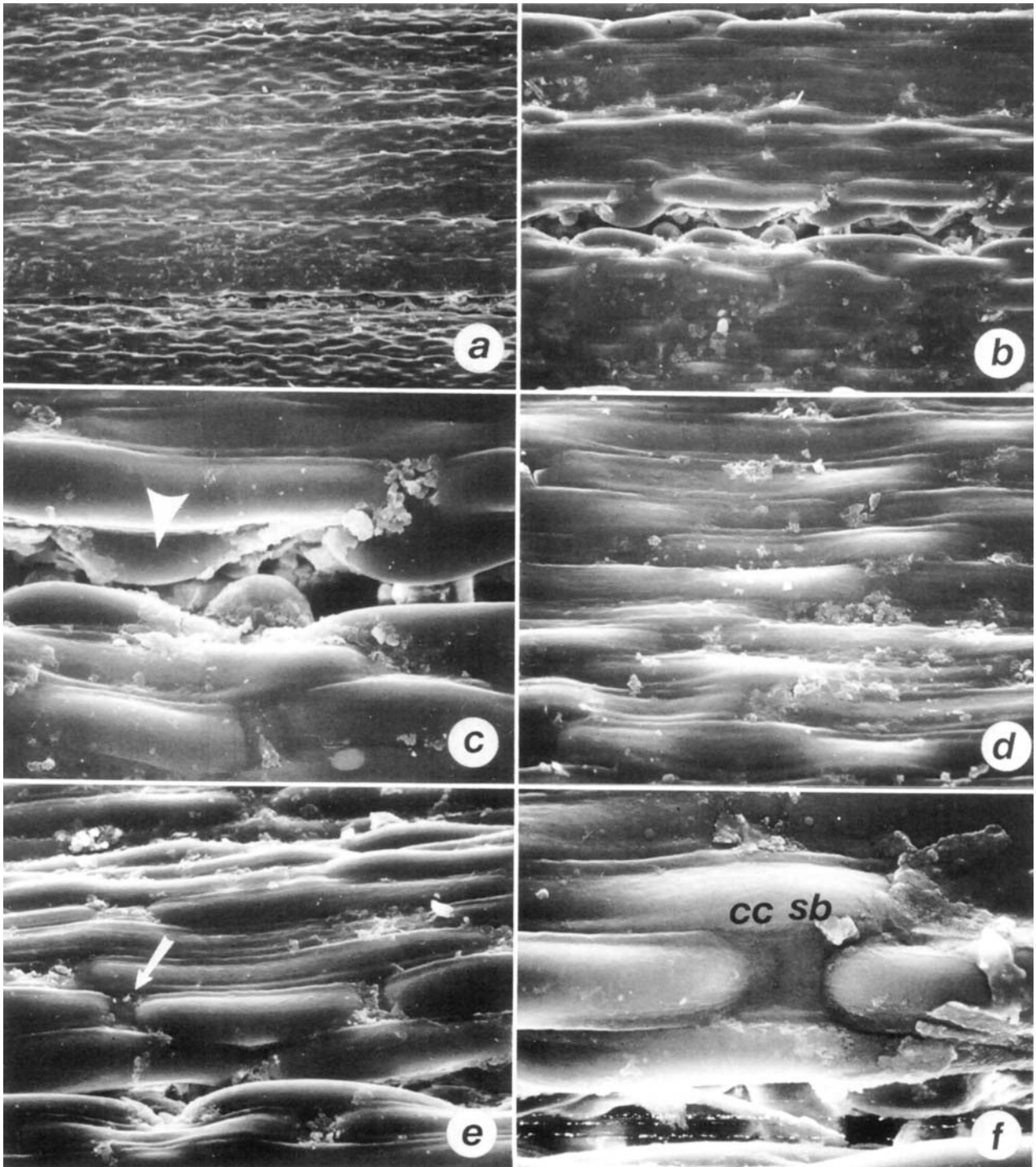


PLATE 33.—Abaxial epidermis *Halopyrum mucronatum*, Polhill and Paulo 766: *a*, overview, $\times 80$; *b*, stoma obscured in grooves, $\times 295$; *c*, overarching papillae (arrow), $\times 867$; *d*, long cells, $\times 867$; *e*, cork cells (arrow), $\times 625$; *f*, silica body (sb), cork cell (cc), $\times 1285$.

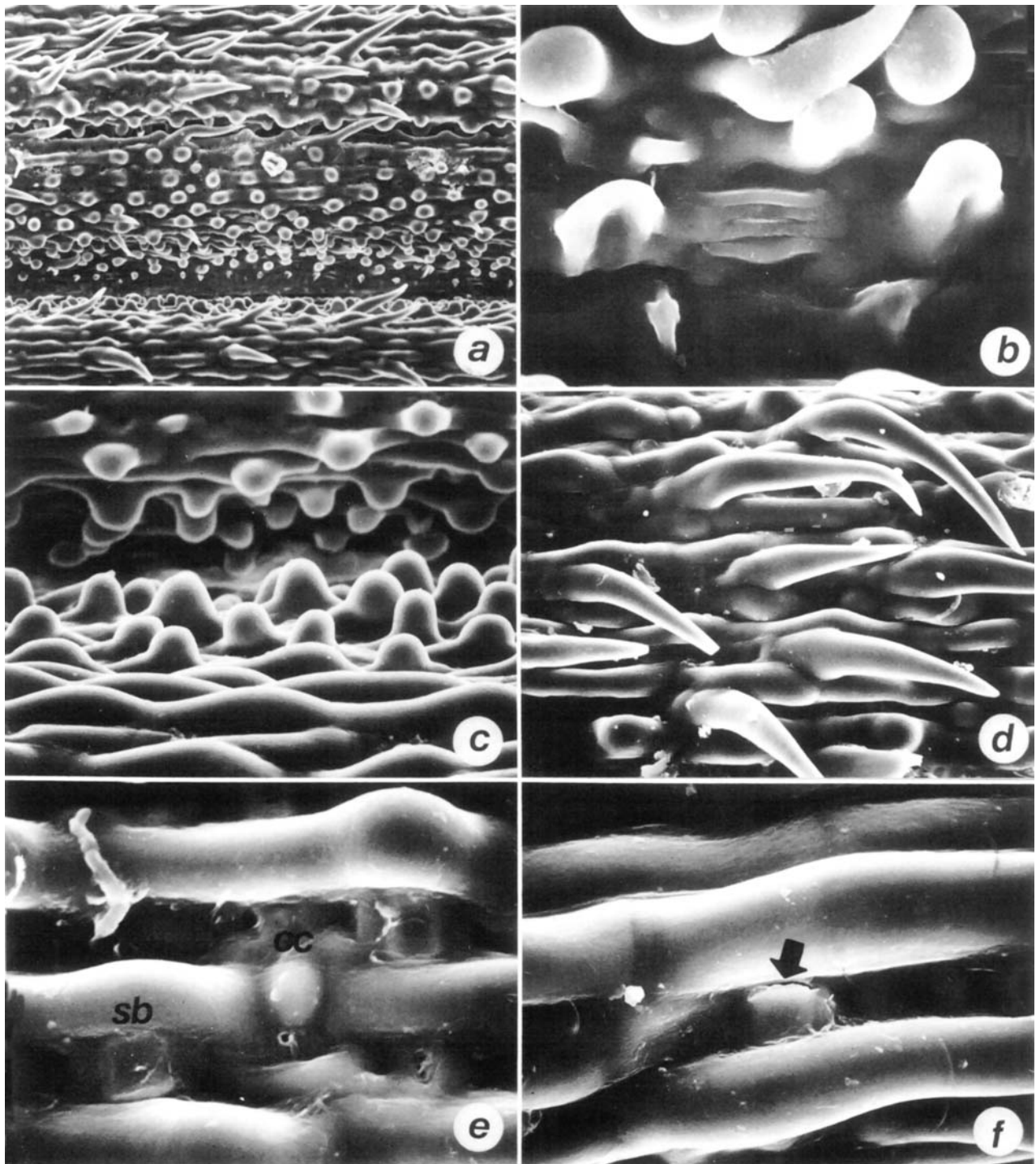


PLATE 34.—Adaxial epidermis *Halopyrum mucronatum*, Polhill and Paulo 766: *a*, overview, $\times 161$; *b*, stoma, interstomatal cells, $\times 1696$; *c*, long cells, stomata obscured in grooves, $\times 625$; *d*, costal prickles, $\times 416$; *e*, silica bodies (sb), papillate cork cells (cc), $\times 1285$; *f*, costal silica body (arrow), $\times 1285$.

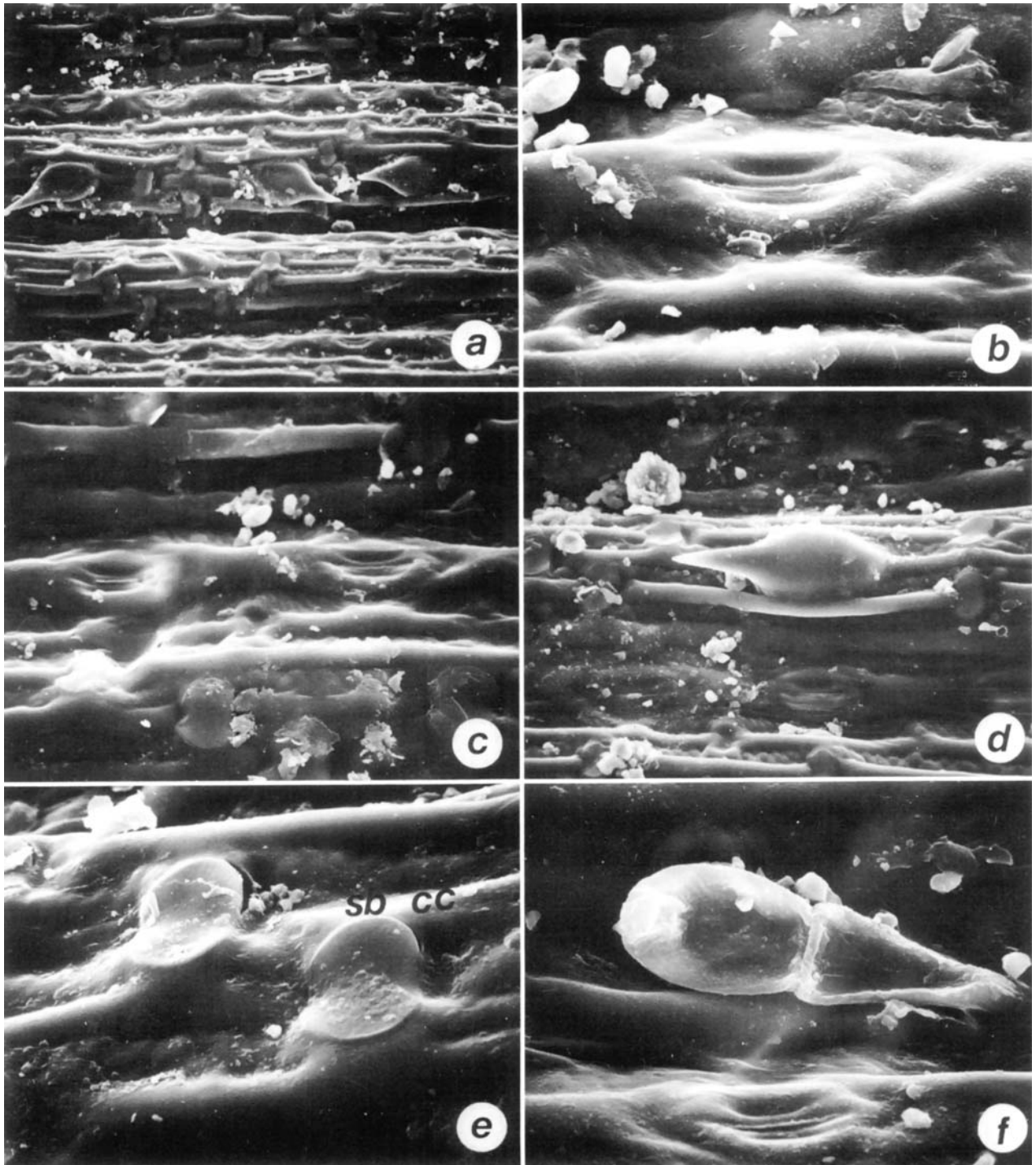


PLATE 35.—Abaxial epidermis *Harpachne schimperi*, Tanner 424: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, $\times 867$; *d*, costal prickle, $\times 625$; *e*, costal silica body (sb), cork cell (cc), $\times 1696$; *f*, microhair, $\times 1696$.

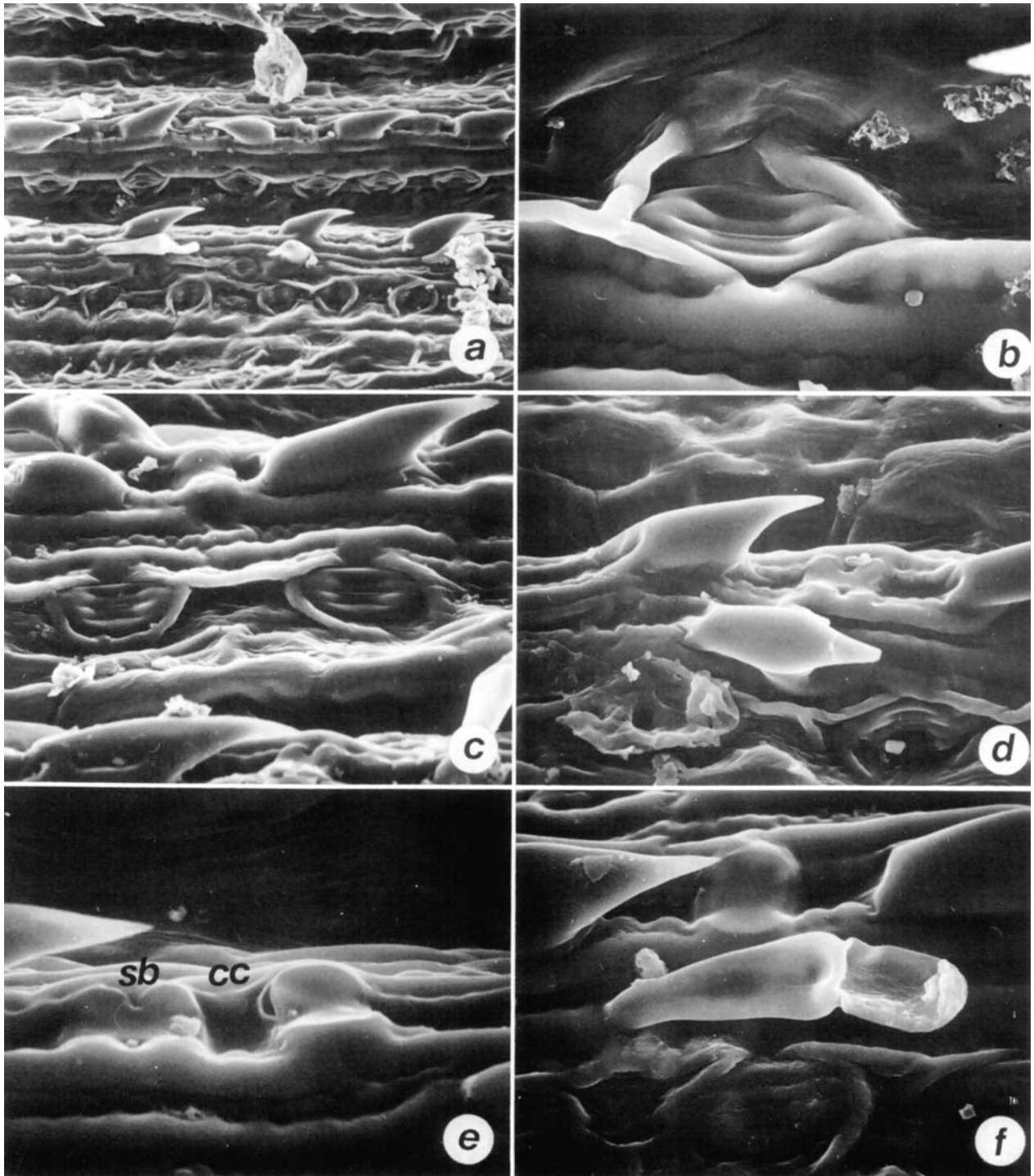


PLATE 36.—Adaxial epidermis *Harpachne schimperi*, Tanner 424: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 867$; *d*, costal prickles, $\times 867$; *e*, costal silica bodies (sb), cork cell (cc), $\times 1696$; *f*, microhair, $\times 1285$.

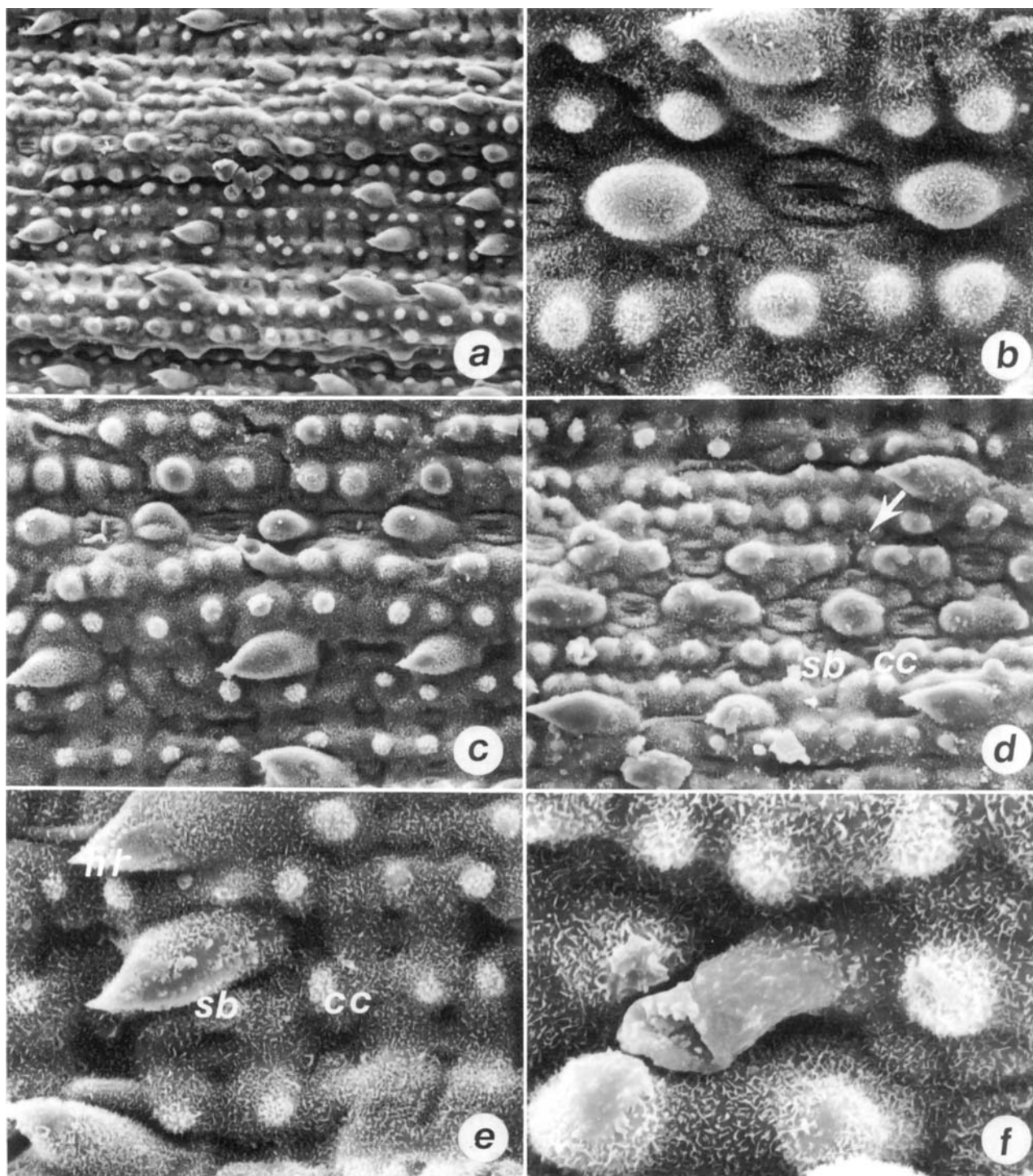


PLATE 37.—Abaxial epidermis *Leptocarydion vulpiastrum*, Verdcourt 768: *a*, overview, $\times 320$; *b*, stoma, interstomatal cells, $\times 1250$; *c*, interstomatal cells, long cells, $\times 640$; *d*, interstomatal cells, costal silica bodies (sb), cork cells (cc), intercostal cork cell (arrow), $\times 640$; *e*, prickles, costal silica bodies (sb), cork cells (cc), $\times 1250$; *f*, microhair, $\times 2500$.

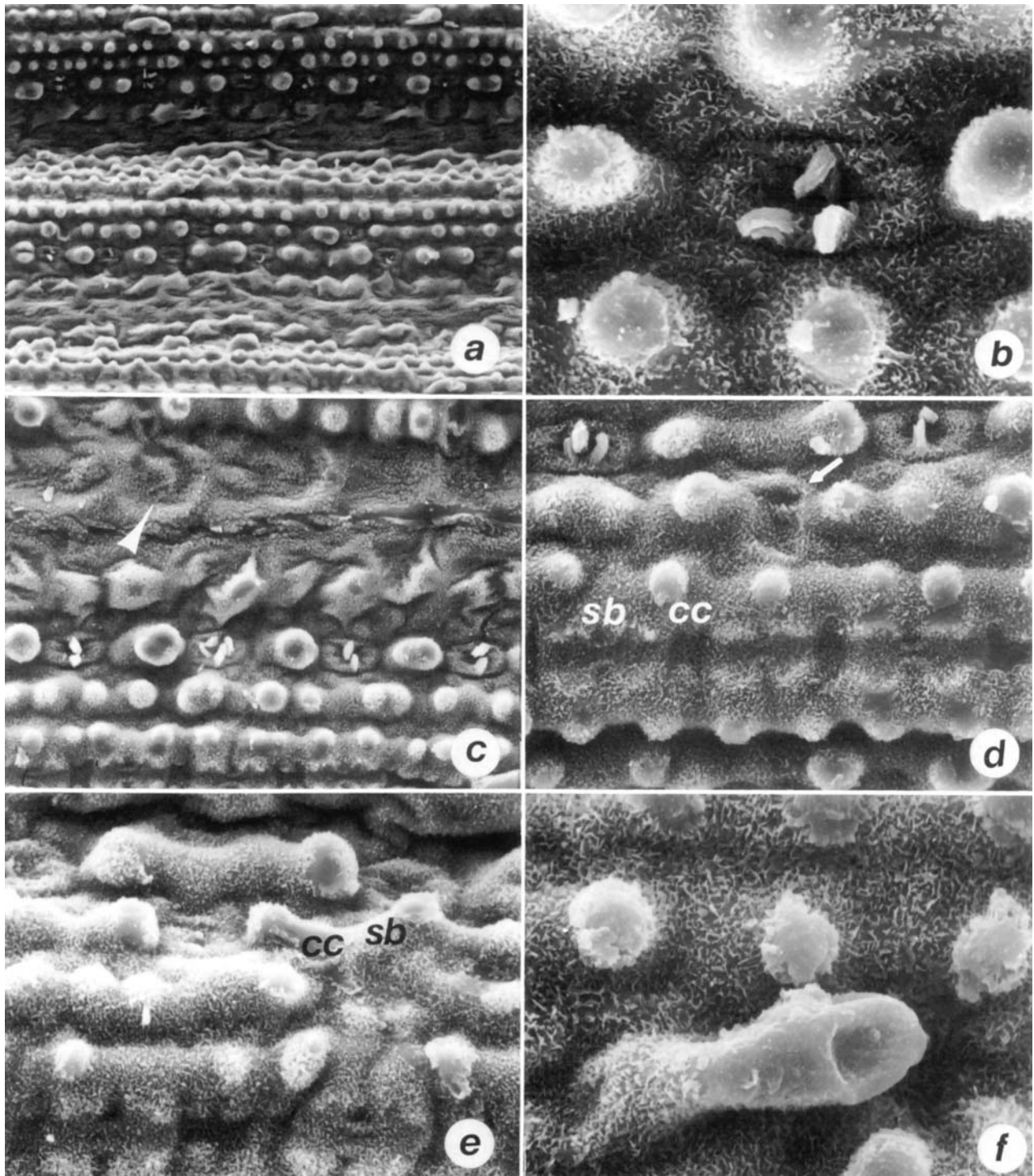


PLATE 38.—Adaxial epidermis *Leptocarydion vulpiastrum*, Verdcourt 768: *a*, overview, $\times 320$; *b*, stoma, $\times 2500$; *c*, interstomatal cells, long cells, mid-intercostal band of deflated cells (arrow), $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), intercostal cork cell (arrow), $\times 1250$; *e*, intercostal silica body (sb), cork cells (cc), $\times 1250$; *f*, microhair, $\times 2500$.

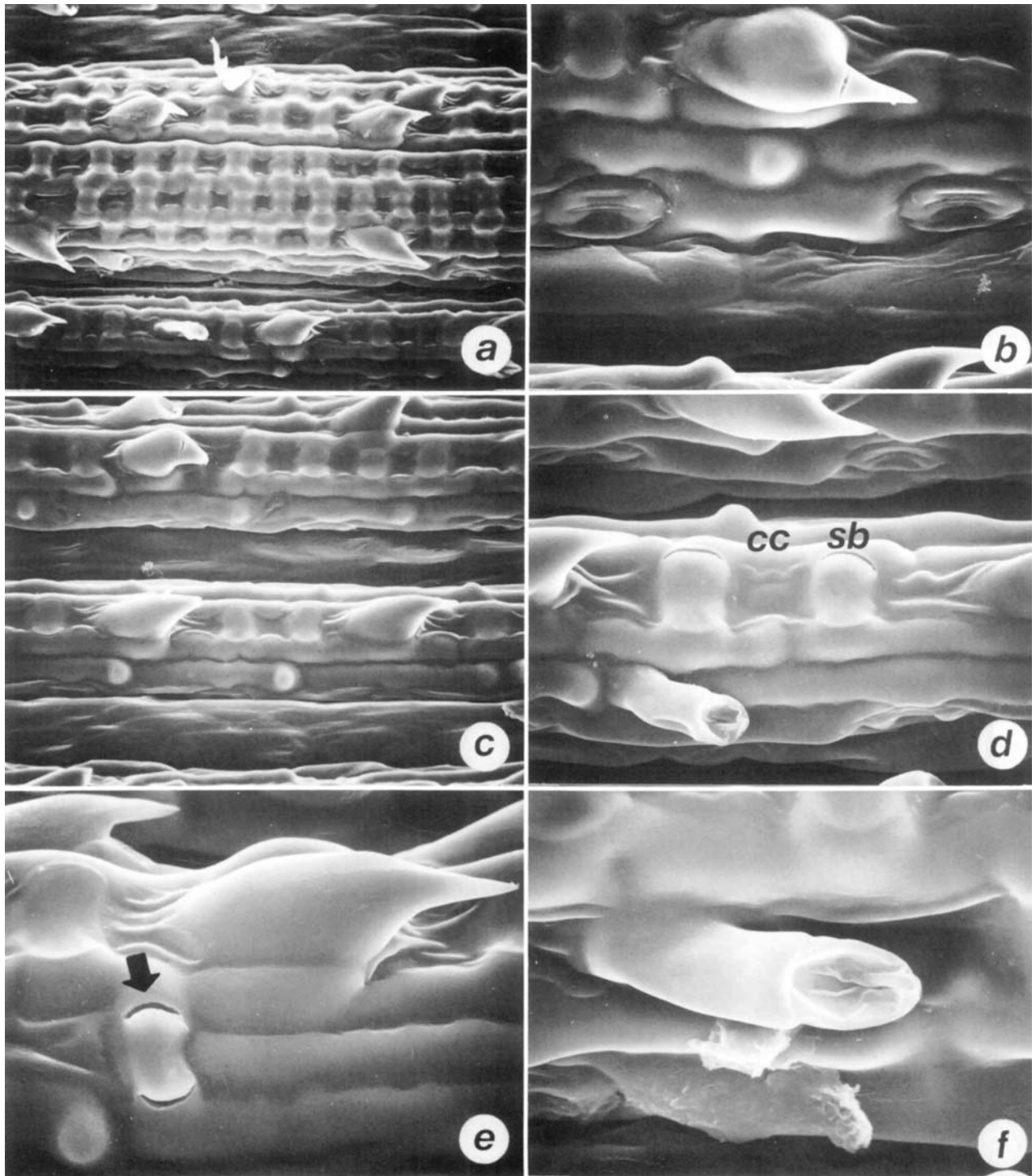


PLATE 39.—Abaxial epidermis *Leptochloa obtusiflora*, Webster K164: *a*, overview, $\times 295$; *b*, stomata, interstomatal cell, long cells, $\times 867$; *c*, long cells, prickles, $\times 416$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, prickle, intercostal silica body (arrow), $\times 1285$; *f*, microhair, $\times 1696$.

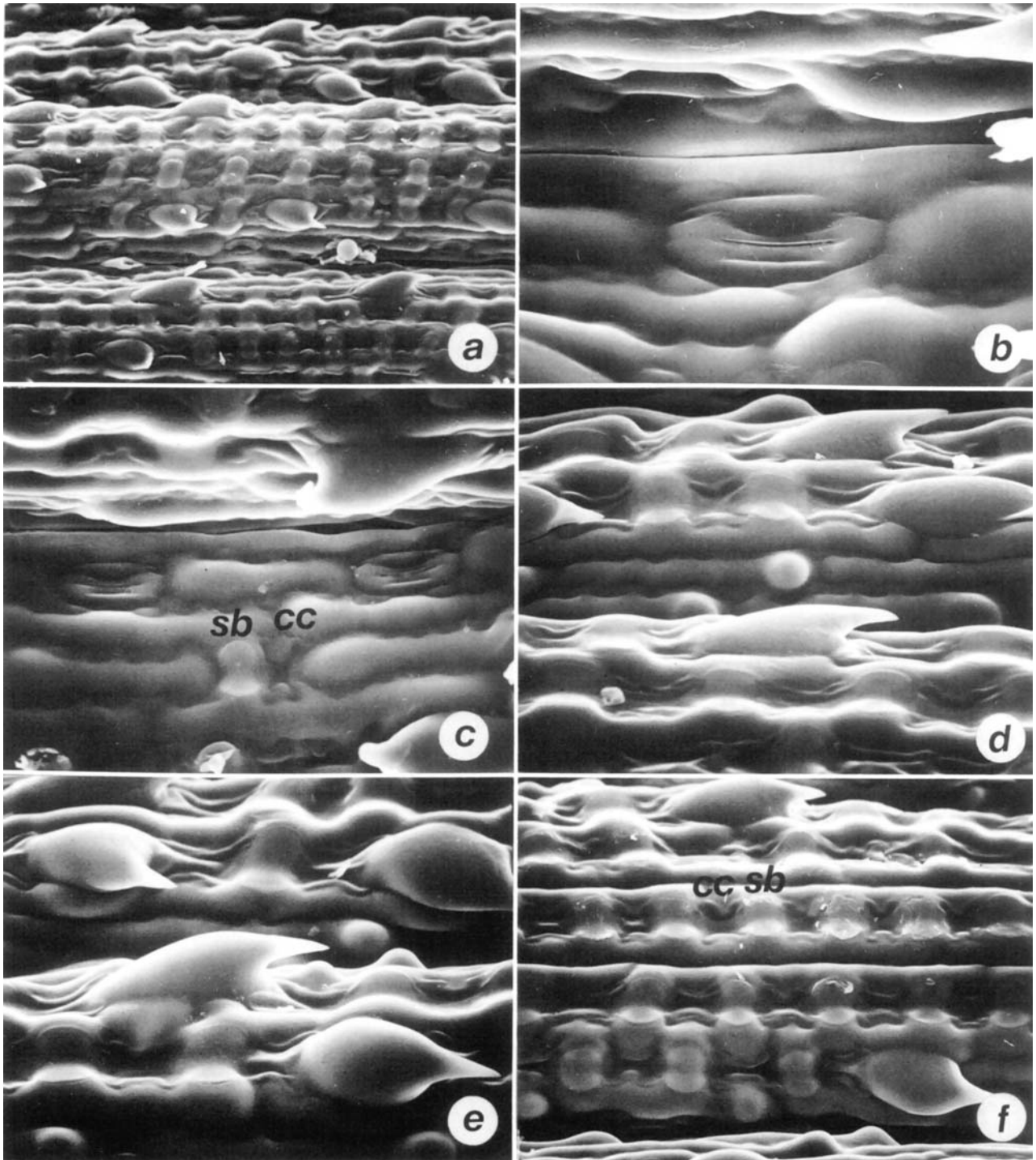


PLATE 40.—Adaxial epidermis *Leptochloa obtusiflora*, Webster K164: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, intercostal silica body (sb), cork cell (cc), $\times 867$; *d*, long cells, $\times 867$; *e*, costal prickle, $\times 867$; *f*, costal silica bodies (sb), cork cells (cc), $\times 625$.

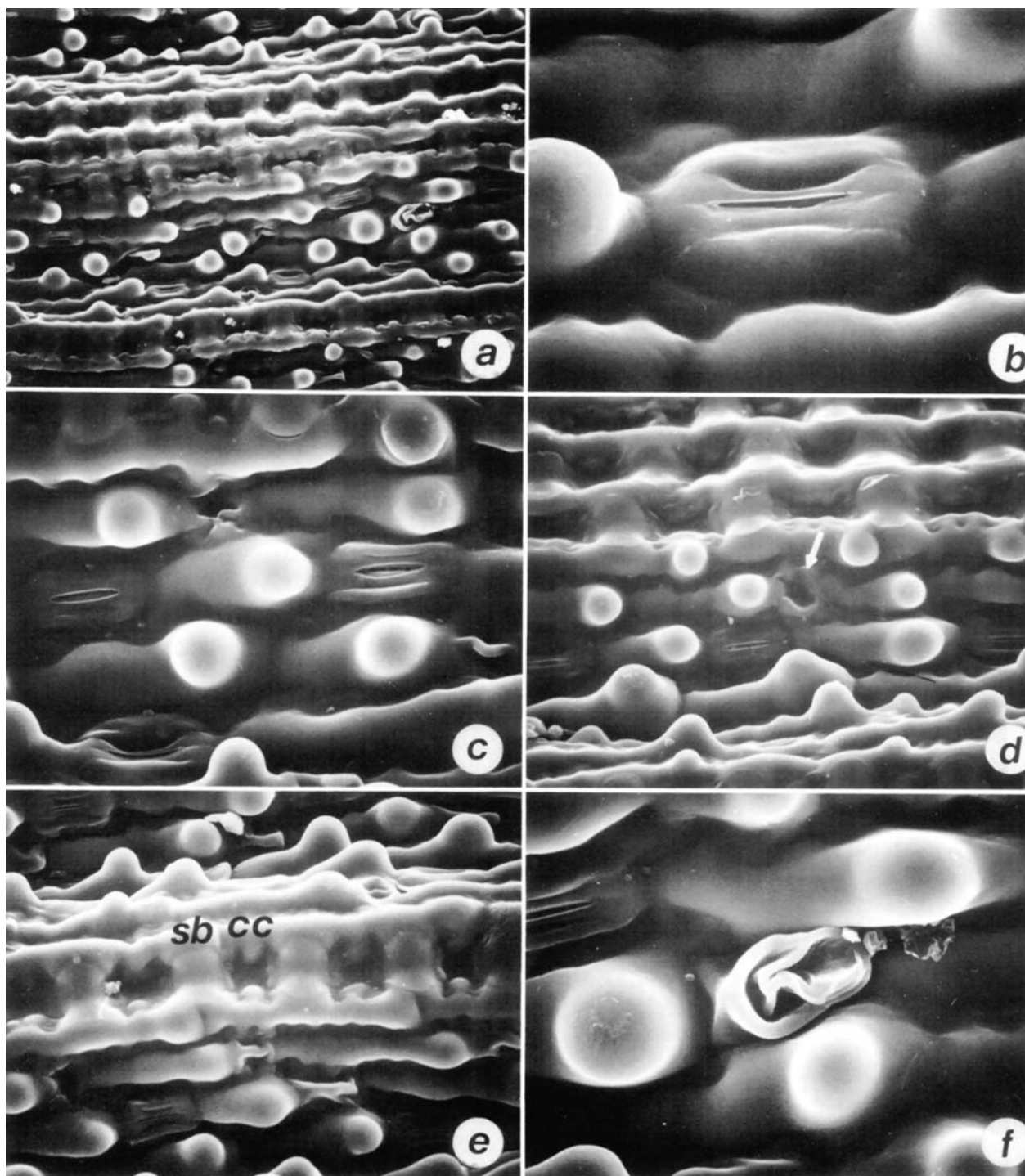


PLATE 41.—Abaxial epidermis *Lintonia nutans*, Magogo 1351: *a*, overview, $\times 416$; *b*, stoma, $\times 2970$; *c*, interstomatal cell, long cells, $\times 1285$; *d*, intercostal cork cell (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 625$; *f*, microhair, $\times 1696$.

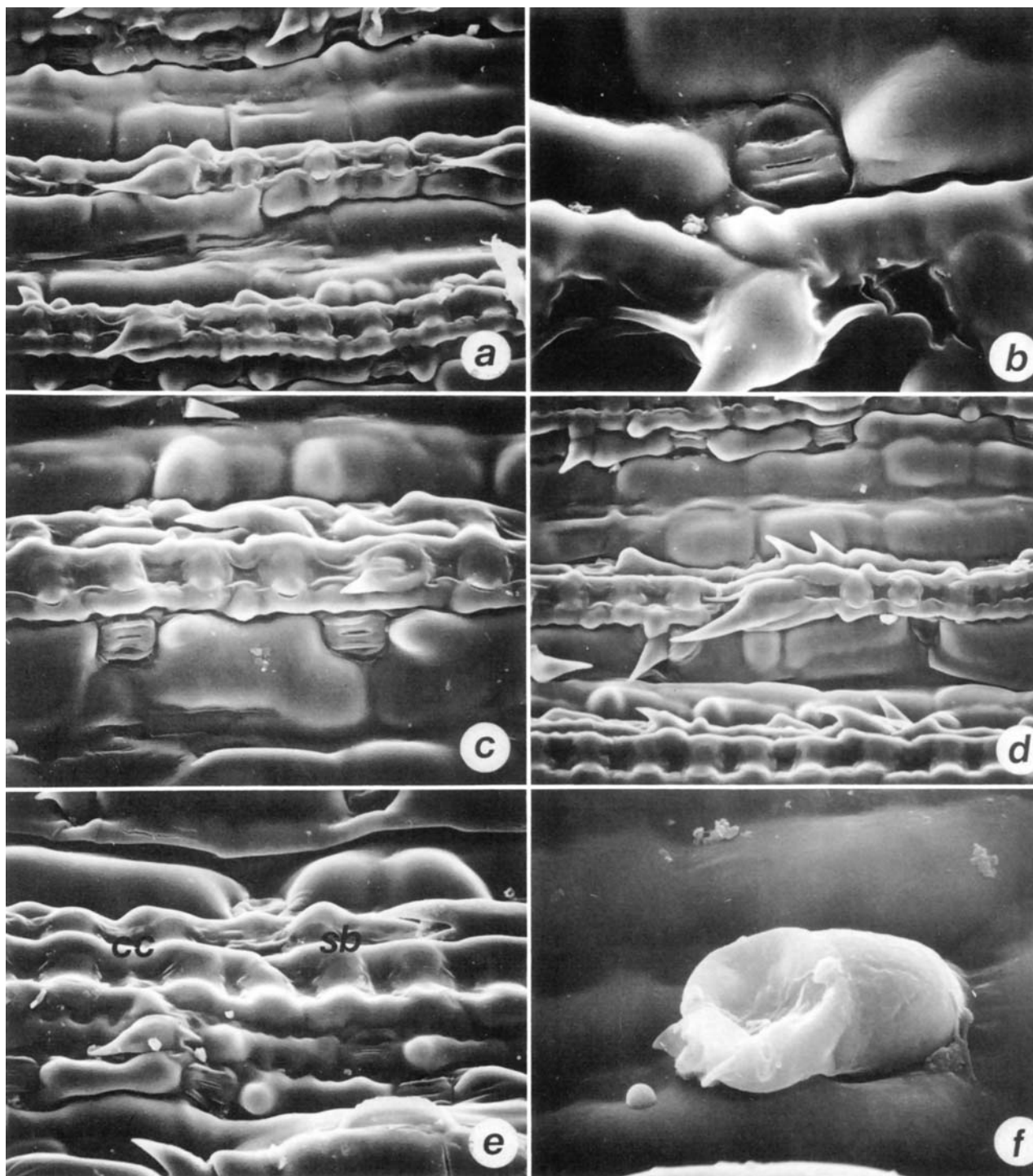


PLATE 42.—Adaxial epidermis *Lintonia nutans*, Magogo 1351: *a*, overview, $\times 416$; *b*, stoma, $\times 1285$; *c*, interstomatal cell, $\times 625$; *d*, prickles, $\times 416$; *e*, costal silica bodies (sb), cork cells (cc), $\times 625$; *f*, microhair, $\times 2970$.

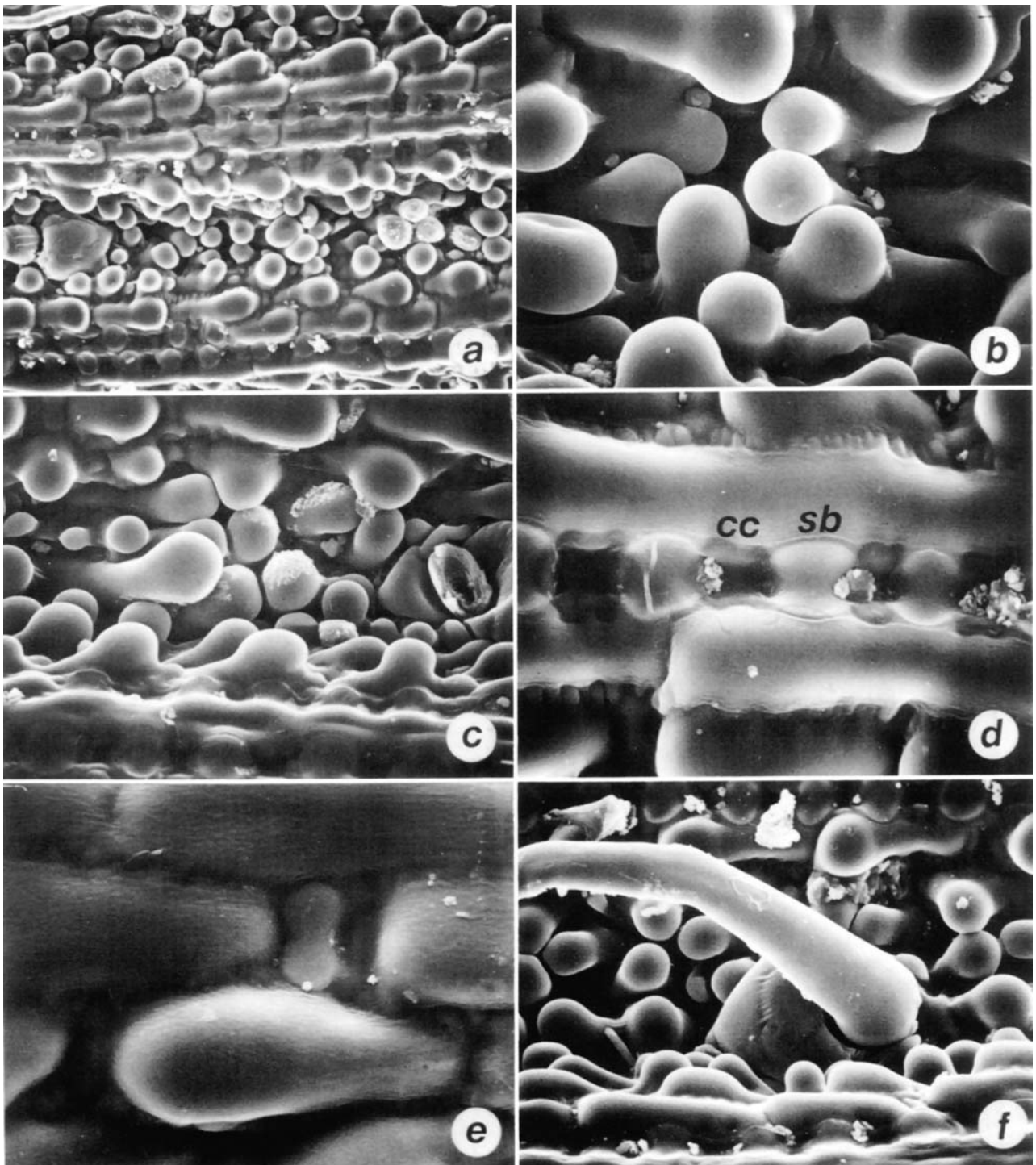


PLATE 43.—Abaxial epidermis *Odyssea paucinervis*, Greenway and Kanuri 12576: *a*, overview, $\times 295$; *b*, stoma with overarching papillae, $\times 1285$; *c*, long cells, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *e*, intercostal silica cell, $\times 1250$; *f*, base of macrohair, $\times 625$.

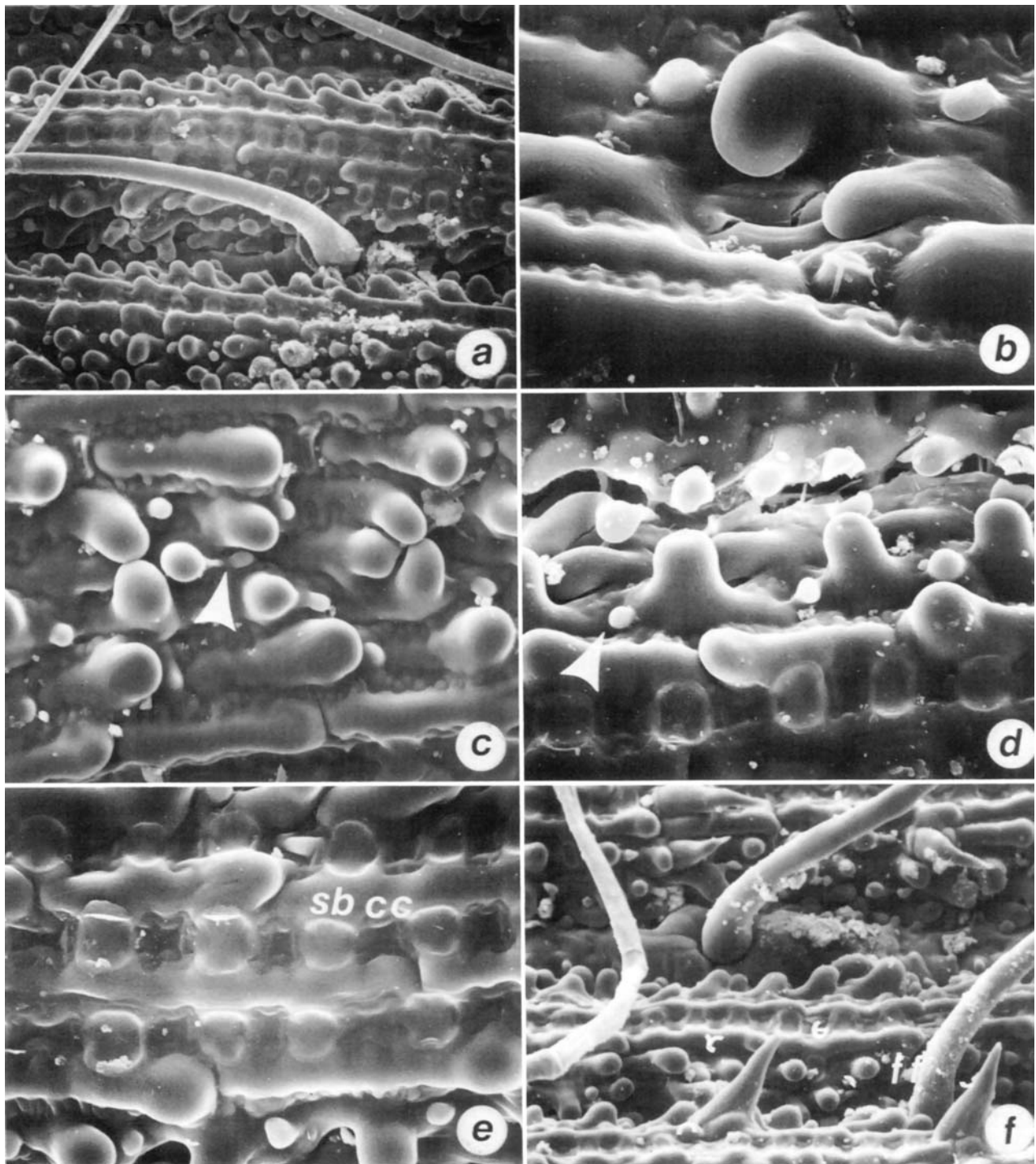


PLATE 44.—Adaxial epidermis *Odyssea paucinervis*, Greenway and Kanuri 12576: *a*, overview, $\times 295$; *b*, stoma with overarching papillae, $\times 1696$; *c*, interstomatal cell (arrow), $\times 640$; *d*, long cells, intercostal cork cells (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, prickles, macrohairs, $\times 320$.

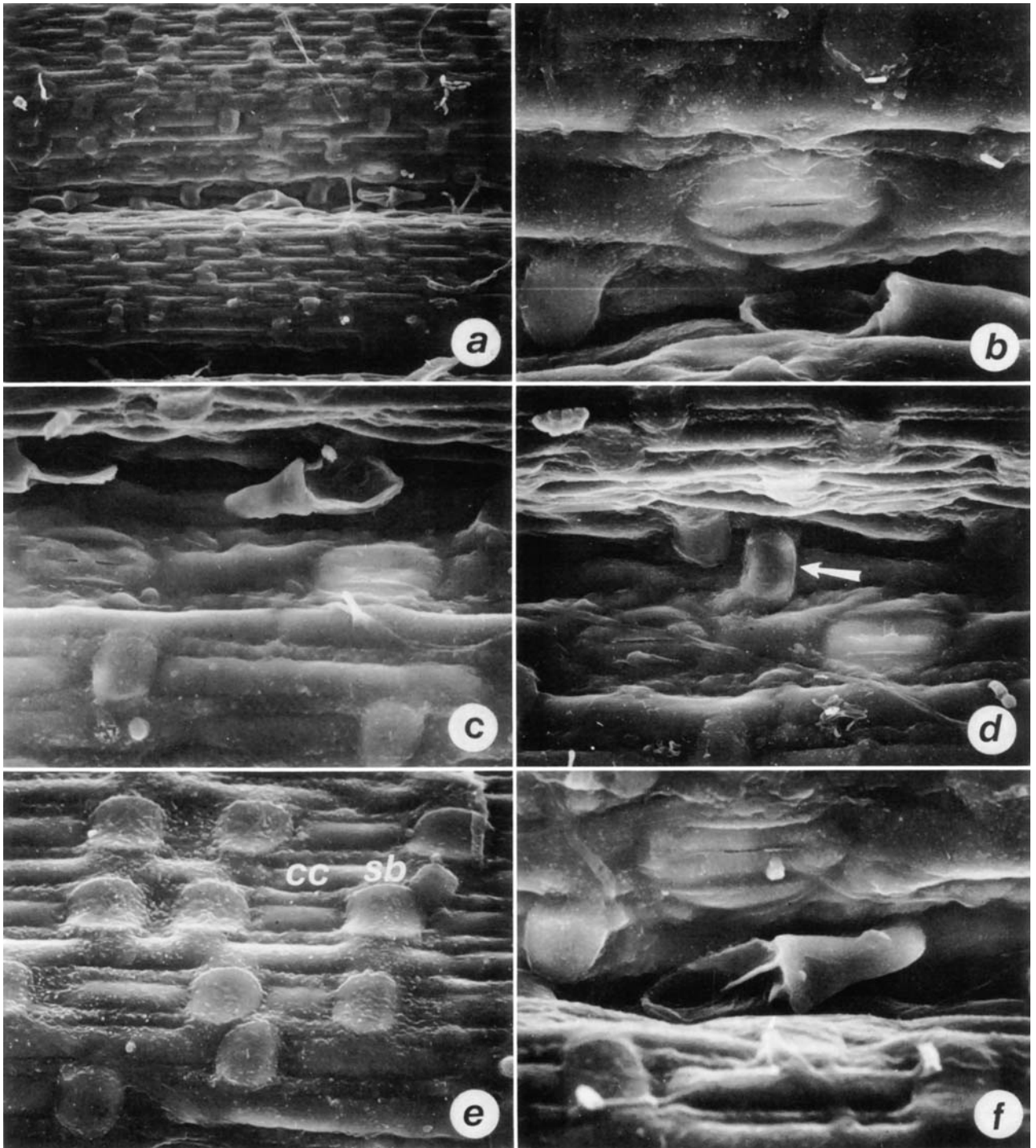


PLATE 45.—Abaxial epidermis *Pogonarthria squarrosa*, Davidse and Handlos 7256: *a*, overview, $\times 295$; *b*, stoma, $\times 1285$; *c*, interstomatal cell, microhair, $\times 867$; *d*, intercostal silica bodies (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

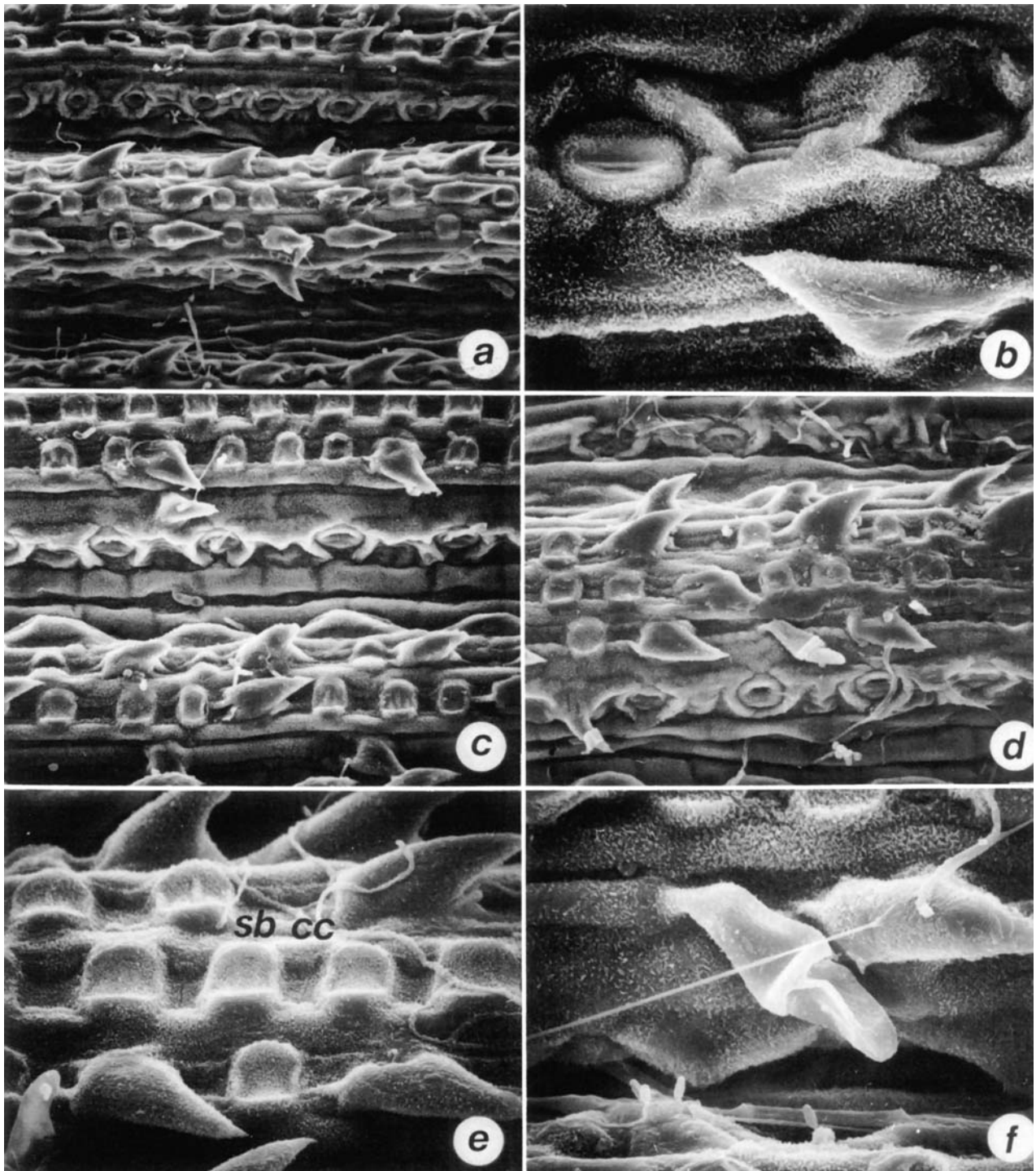


PLATE 46.—Adaxial epidermis *Pogonarthria squarrosa*, Davidse and Handlos 7256: *a*, overview, $\times 295$; *b*, stomata, interstomatal cell, $\times 1285$; *c*, long cells, $\times 416$; *d*, prickles, $\times 416$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

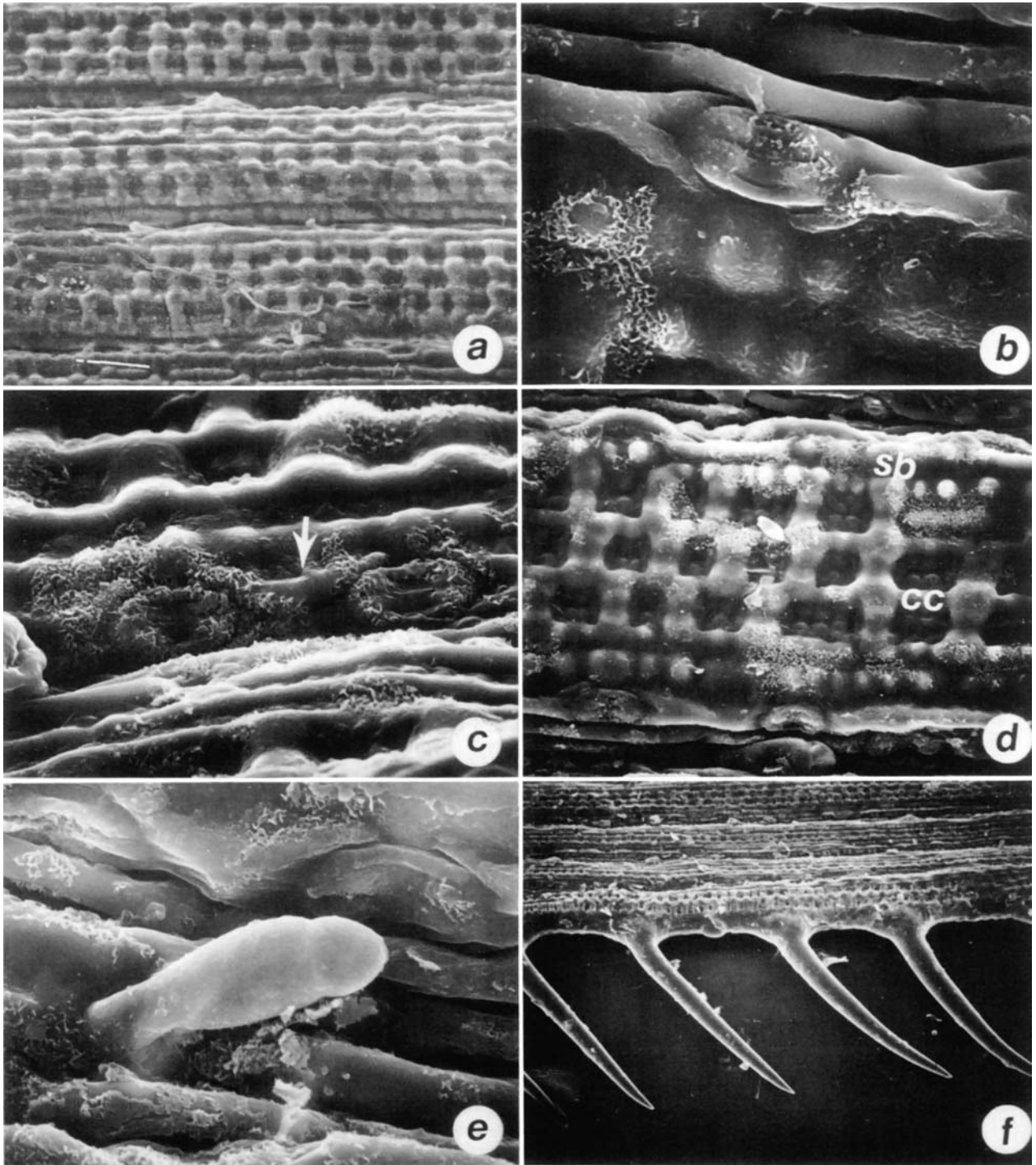


PLATE 47.—Abaxial epidermis *Pogoneura biflora*, Greenway and Turner 10608: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), long cells, $\times 1285$; *d*, costal silica bodies (sb), cork cells (cc), $\times 625$; *e*, microhair, $\times 1696$; *f*, margin with prickles, $\times 80$.

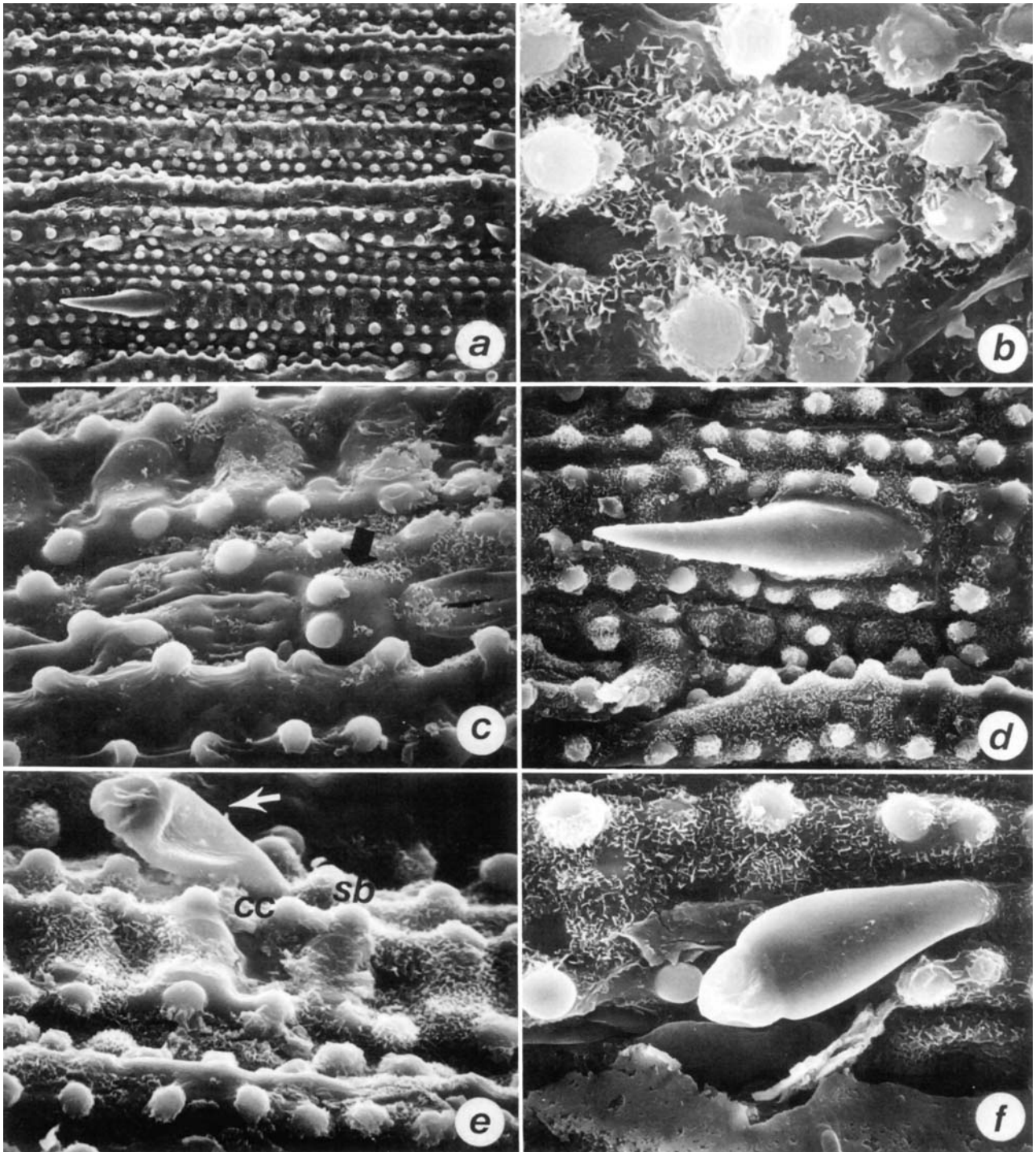


PLATE 48.—Adaxial epidermis *Pogoneura biflora*, Greenway and Turner 10608: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cell (arrow), long cells, $\times 1285$; *d*, costal prickle, intercostal silica body (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), microhair (arrow), $\times 1285$; *f*, microhair, $\times 1696$.

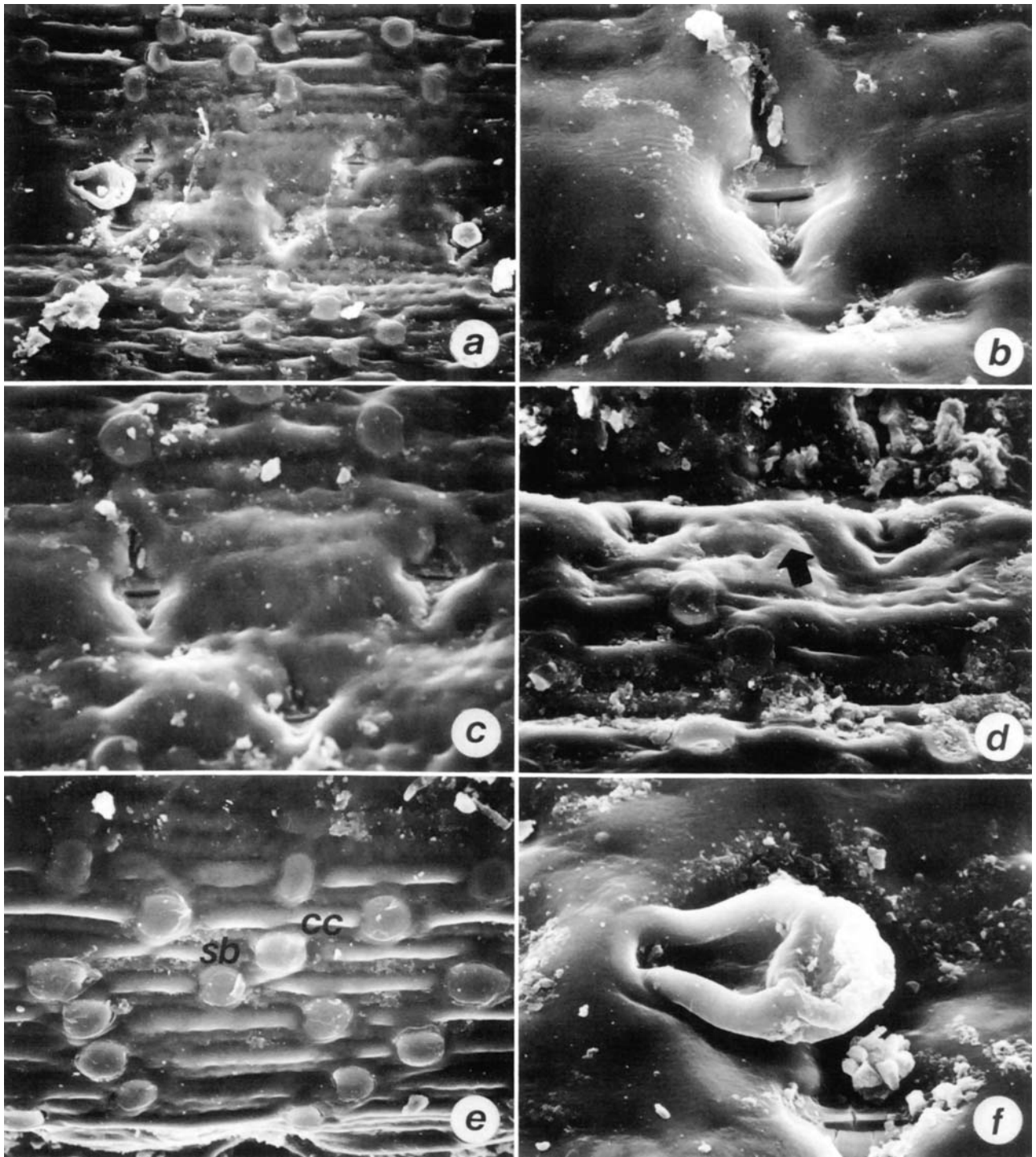


PLATE 49.—Abaxial epidermis *Psilolemma jaegeri*, Bullock 2518: *a*, overview, $\times 416$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 867$; *d*, long cells, interstomatal cell (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 625$; *f*, microhair, $\times 1696$.

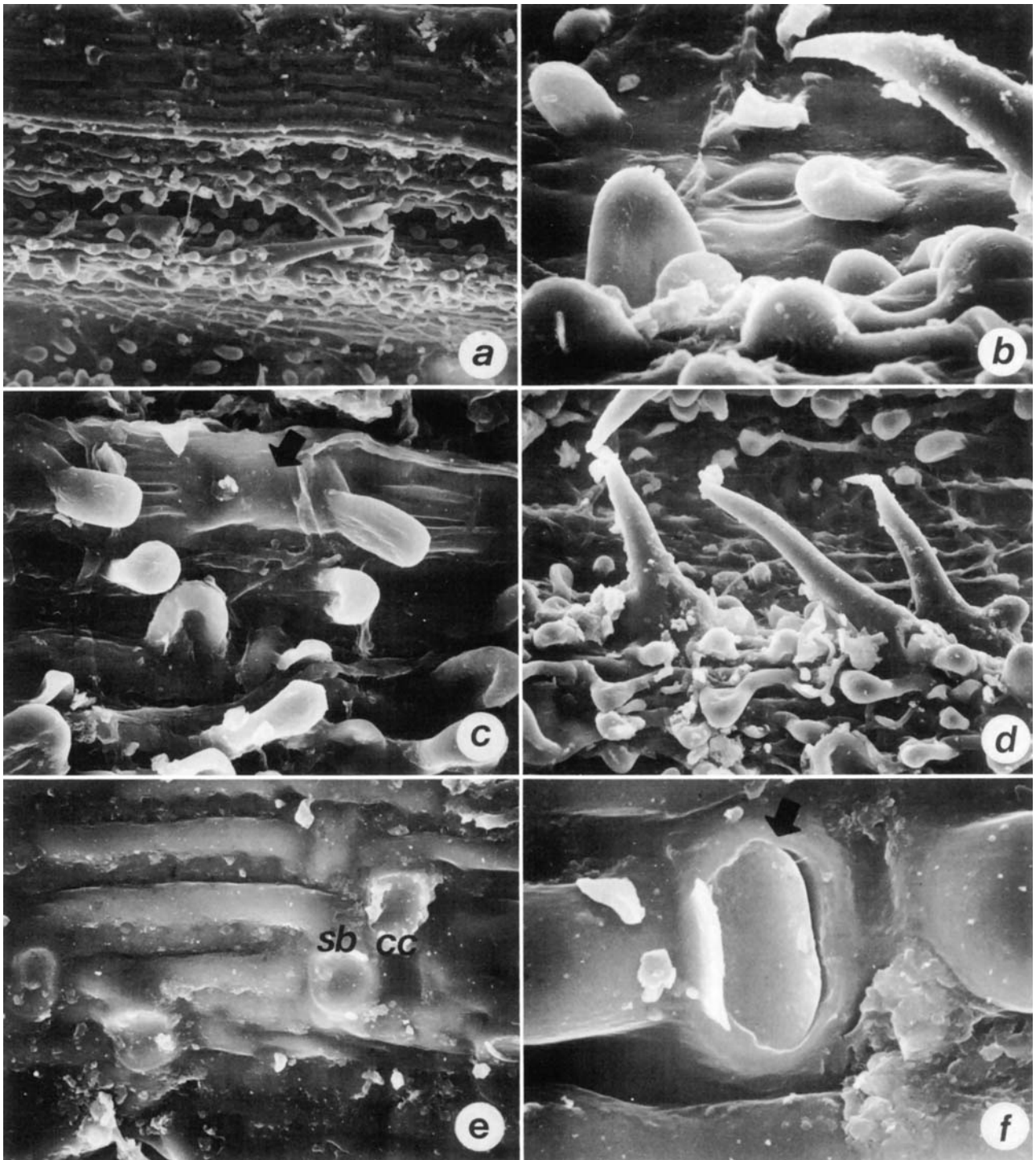


PLATE 50.—Adaxial epidermis *Psilolemma jaegeri*, Bullock 2518: *a*, overview, $\times 295$; *b*, stoma, interstomatal cell, $\times 1696$; *c*, interstomatal cell (arrow), long cells, $\times 1285$; *d*, costal short macrohairs, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, costal silica body (arrow), $\times 4290$.

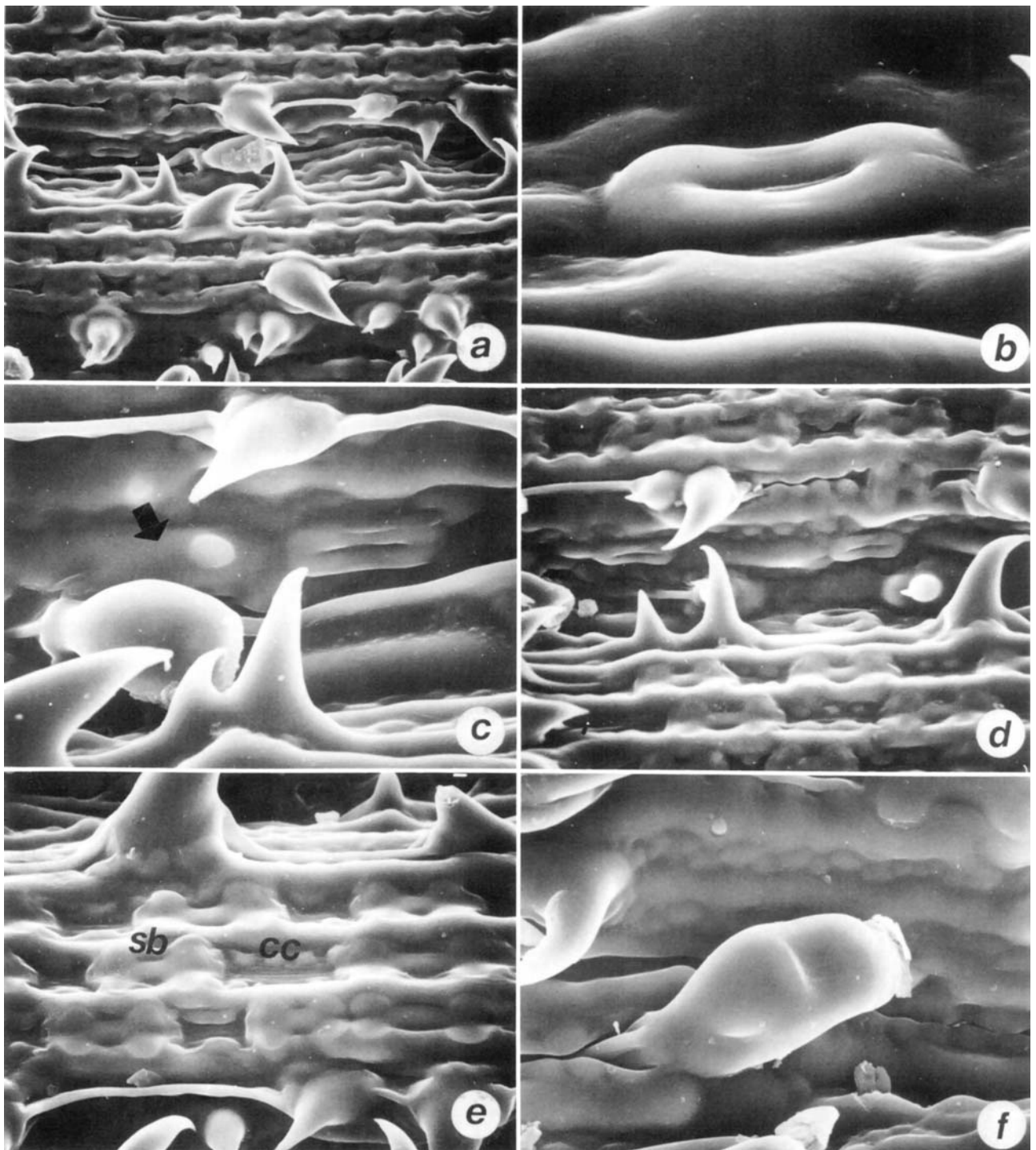


PLATE 51.—Abaxial epidermis *Trichoneura ciliata*, Bogdan AB4172: *a*, overview, $\times 416$; *b*, stoma, $\times 2970$; *c*, interstomatal cell (arrow), $\times 1285$; *d*, prickles, hooks, long cells, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1285$.

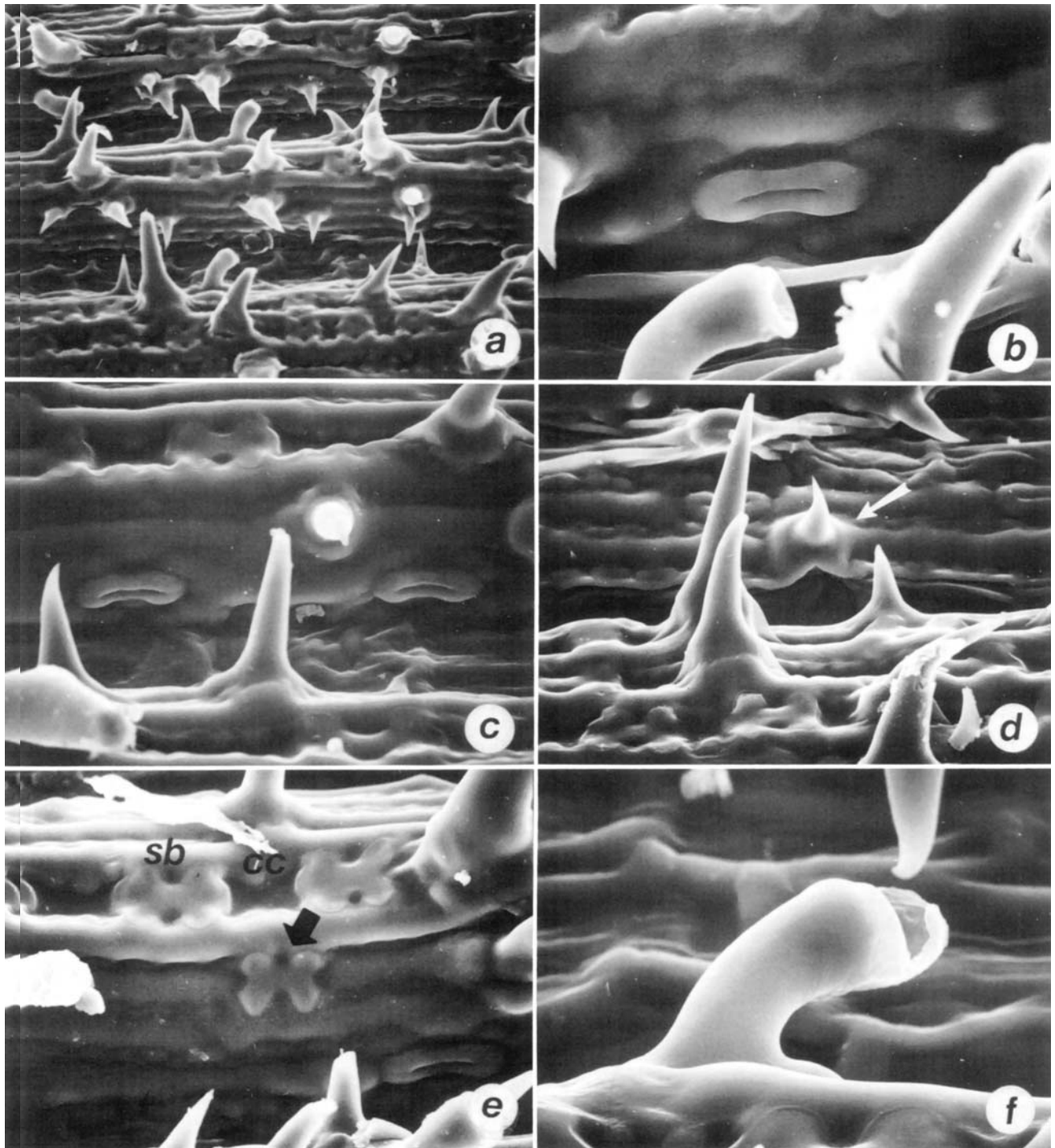


PLATE 52.—Adaxial epidermis *Trichoneura ciliata*, Bogdan AB4172: *a*, overview, $\times 295$; *b*, stoma, $\times 1285$; *c*, interstomatal cell, long cells, $\times 867$; *d*, prickles, hook (arrow), long cells, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), intercostal silica body (arrow), $\times 867$; *f*, microhair, $\times 1696$.

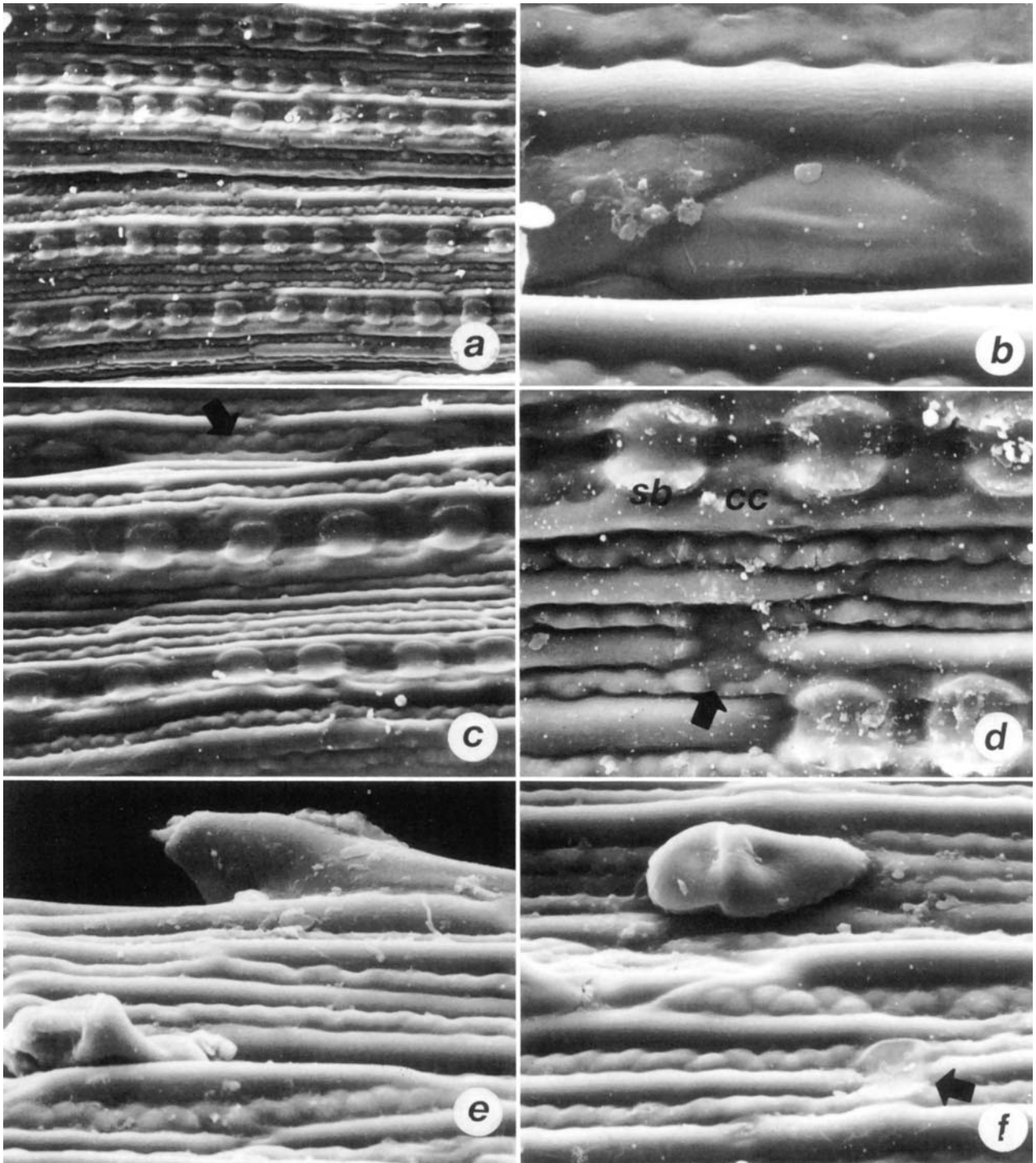


PLATE 53.—Abaxial epidermis *Tripogon major*, Thomas 2925: *a*, overview, $\times 320$; *b*, stoma, $\times 2500$; *c*, interstomatal cell (arrow), long cells, $\times 640$; *d*, intercostal cork cell (arrow), costal silica bodies (sb), cork cells (cc), $\times 1250$; *e*, marginal prickle, $\times 1250$; *f*, microhair, intercostal silica body (arrow), $\times 1250$.

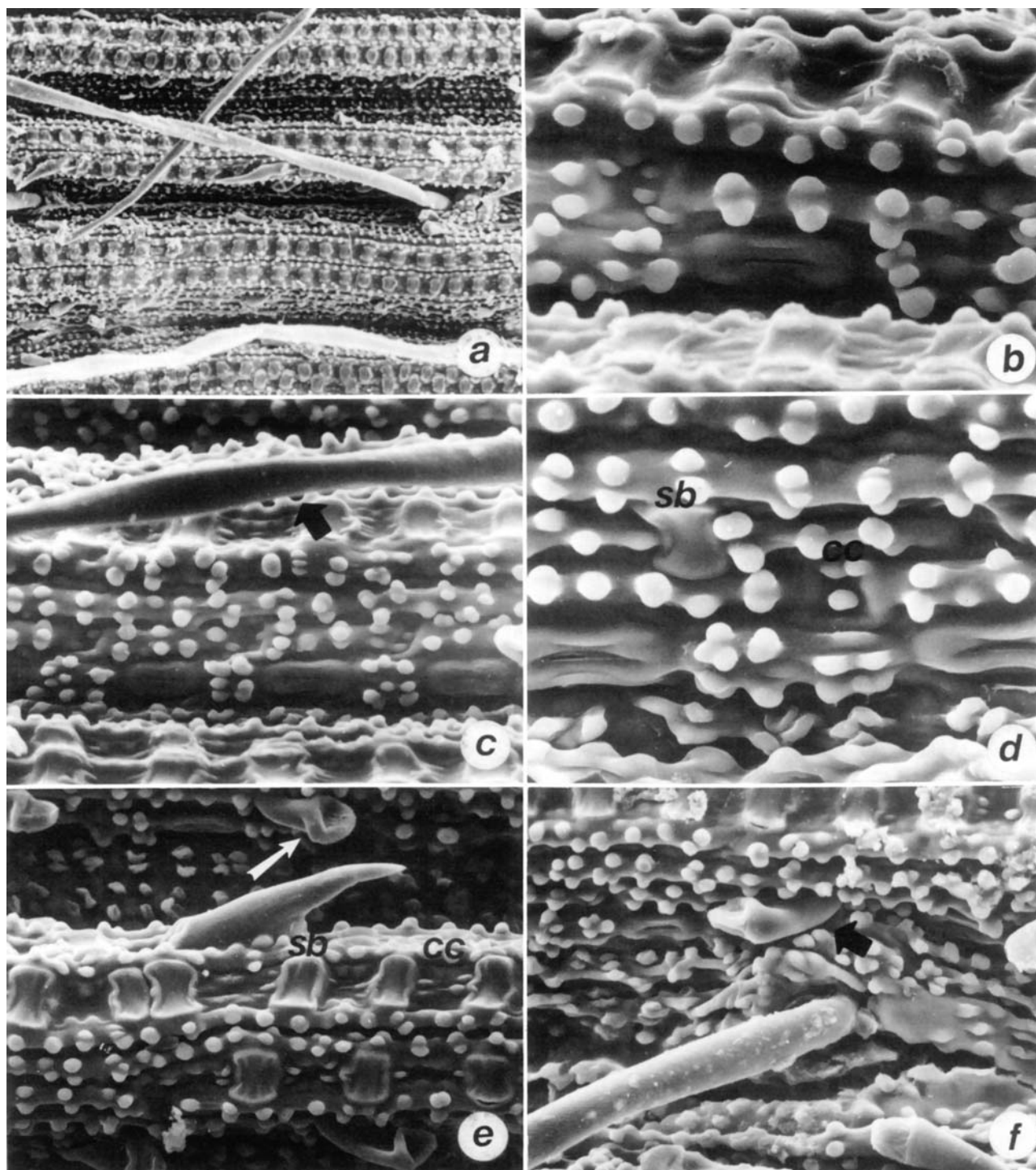


PLATE 54.—Adaxial epidermis *Tripogon major*, Thomas 2925: *a*, overview, $\times 160$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, twisted shaft of macrohair (arrow), $\times 640$; *d*, intercostal silica body (sb), cork cell (cc), $\times 1250$; *e*, costal silica bodies (sb), cork cells (cc), prickle, microhairs (arrow), $\times 640$; *f*, base of macrohair, microhair (arrow), $\times 640$.

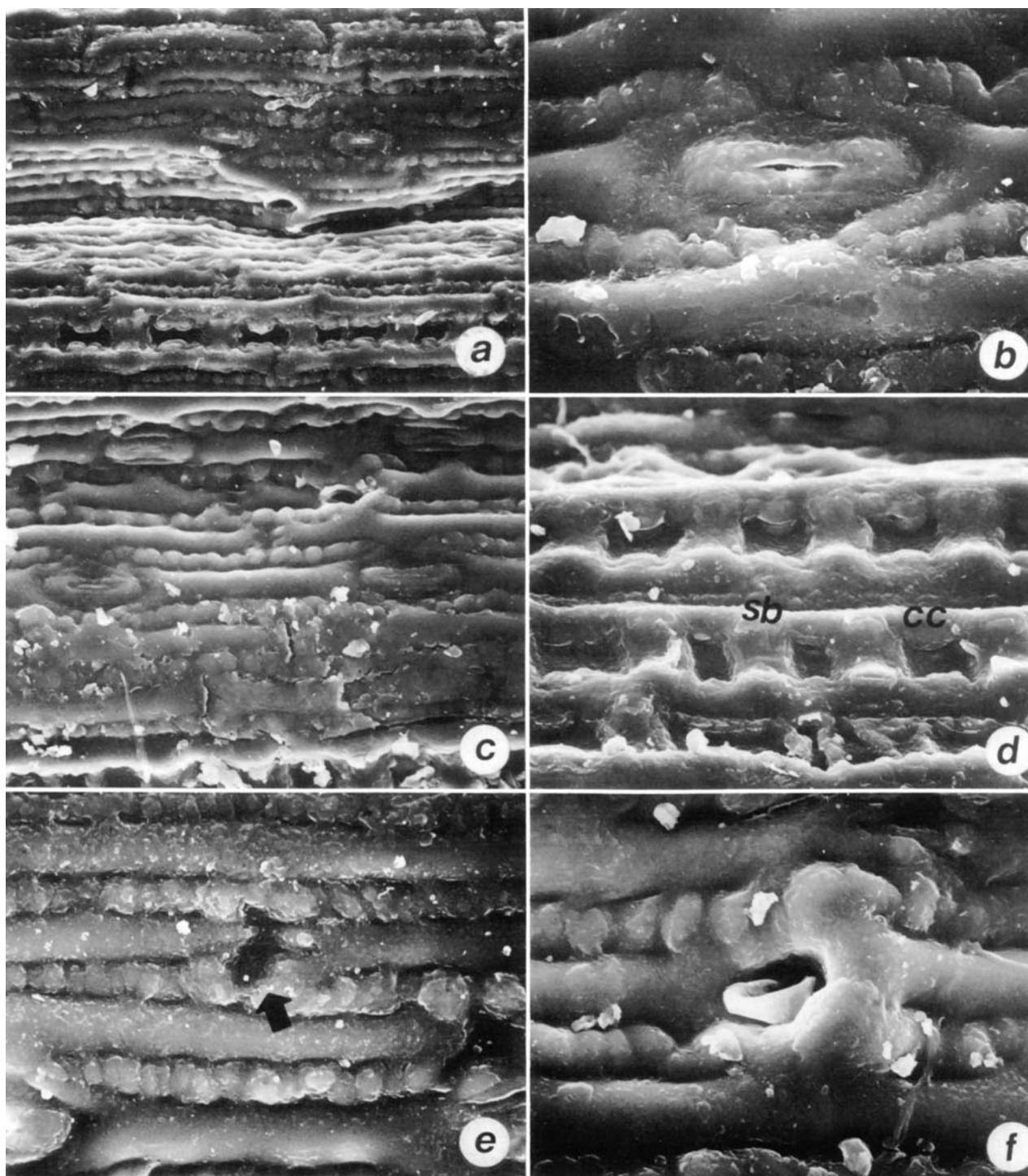


PLATE 55.—Abaxial epidermis *Brachyachne fulva*, Simon and Williamson 1617: *a*, overview, $\times 416$; *b*, stoma, long cells, $\times 1696$; *c*, interstomatal cell, long cells, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, long cells, intercostal cork cell (arrow), $\times 1285$; *f*, microhair, $\times 1696$.

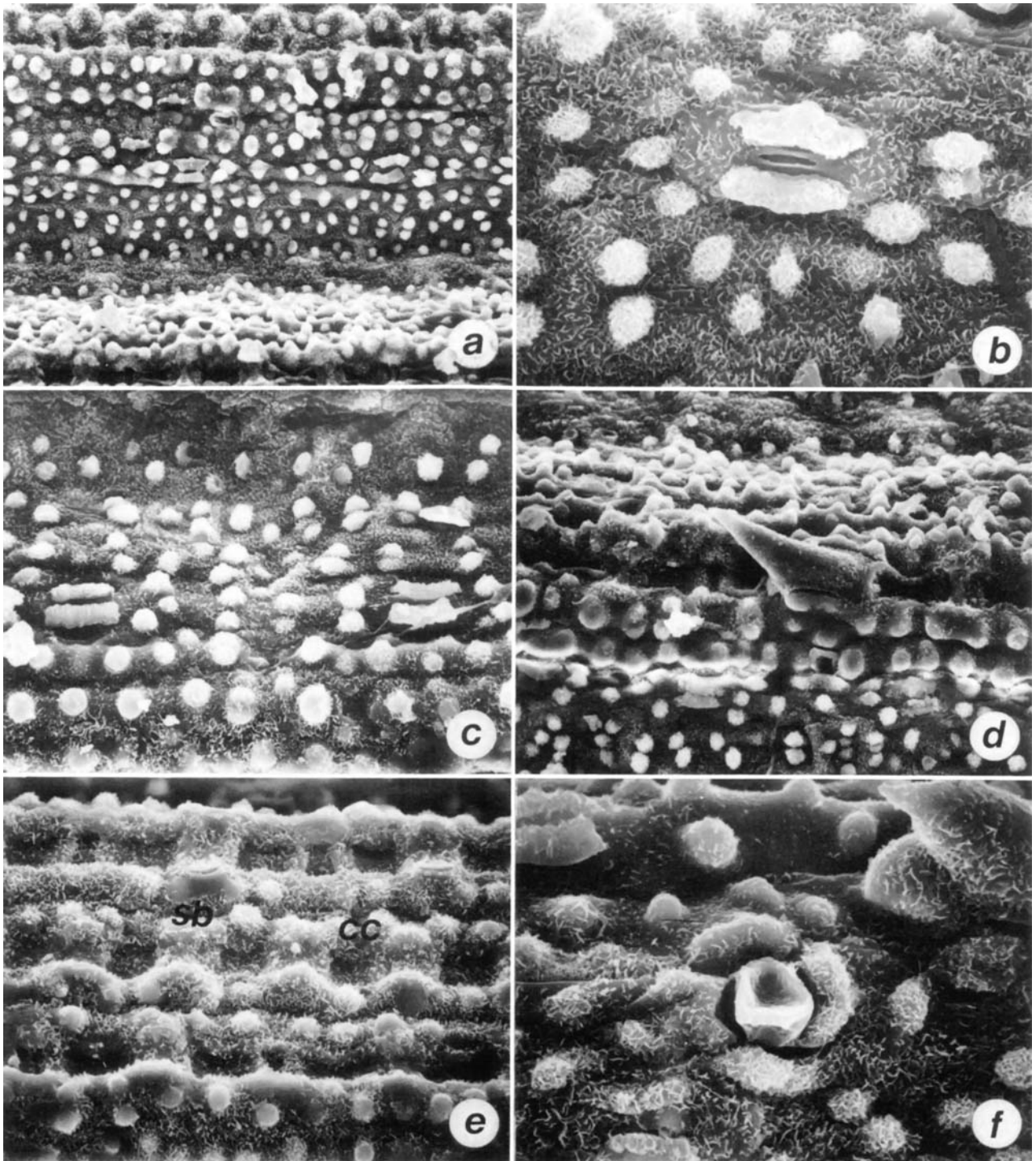


PLATE 56.—Adaxial epidermis *Brachyachne fulva*, Simon and Williamson 1617: *a*, overview, $\times 416$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, $\times 867$; *d*, costal prickle, $\times 625$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 1696$.

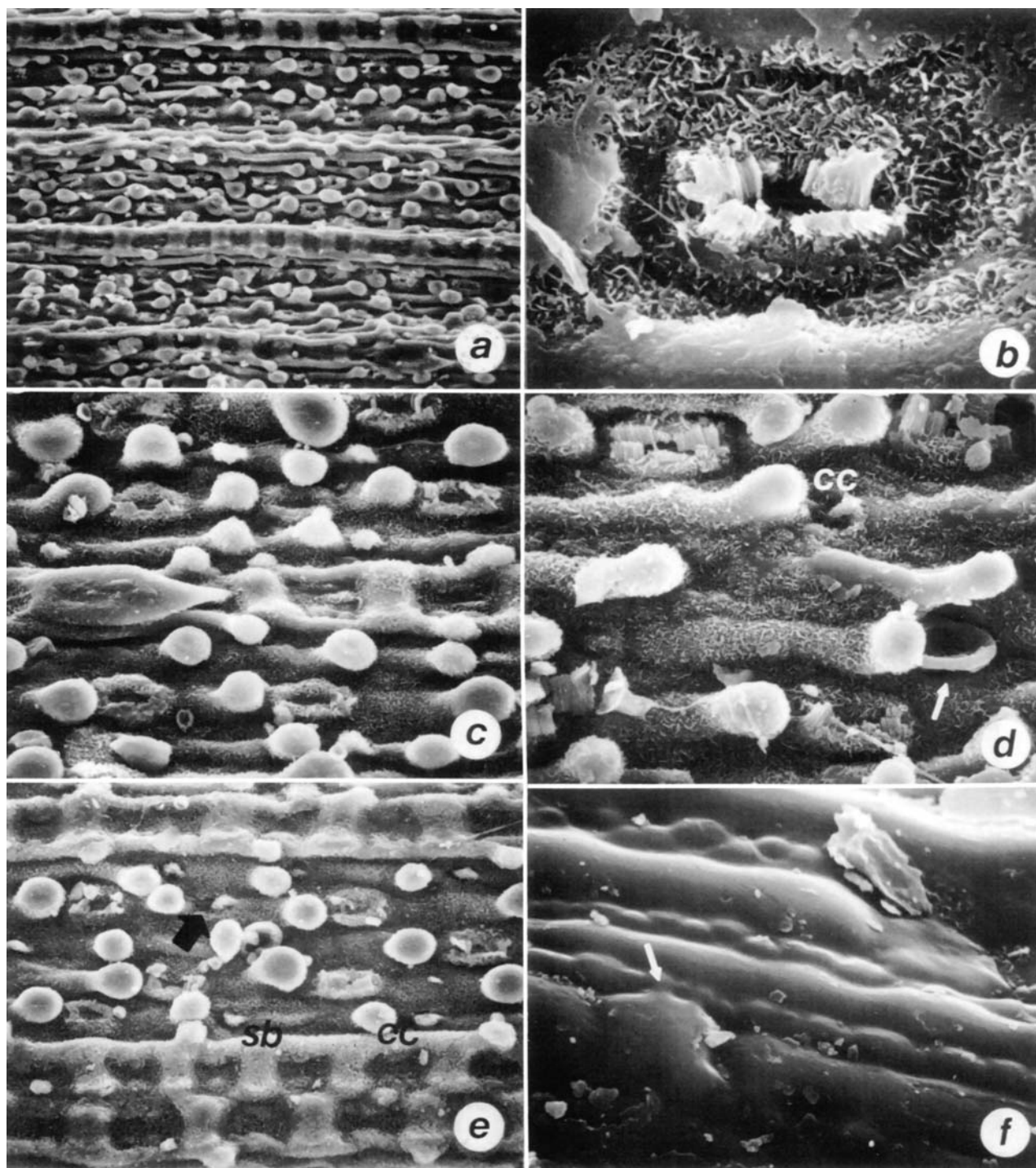


PLATE 57.—Abaxial epidermis *Chloris virgata*, Shantz 509: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cells, long cells, short cells, prickle, $\times 867$; *d*, long cells, microhair (arrow), intercostal cork cell (cc), $\times 1285$; *e*, costal silica bodies (sb), cork cells (cc), intercostal cork cell (arrow), $\times 625$; *f*, marginal long cells, silica body (arrow), $\times 2970$.

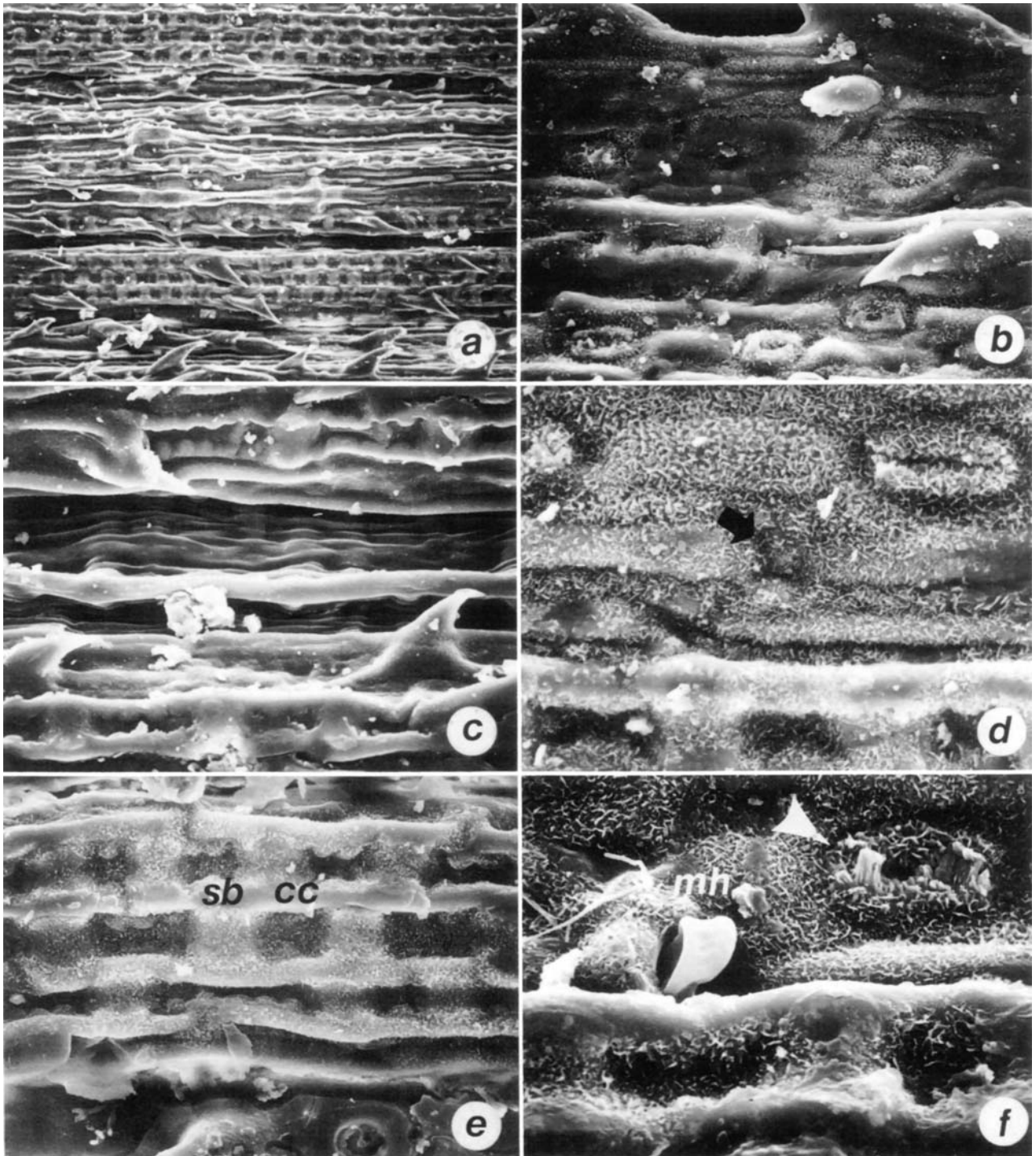


PLATE 58.—Adaxial epidermis *Chloris virgata*, Shantz 509: *a*, overview, $\times 161$; *b*, stomata, marginal area, $\times 625$; *c*, long cells, prickles, $\times 625$; *d*, intercostal cork cell (arrow), $\times 1250$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, stoma (arrow), microhair (mh), $\times 1696$.

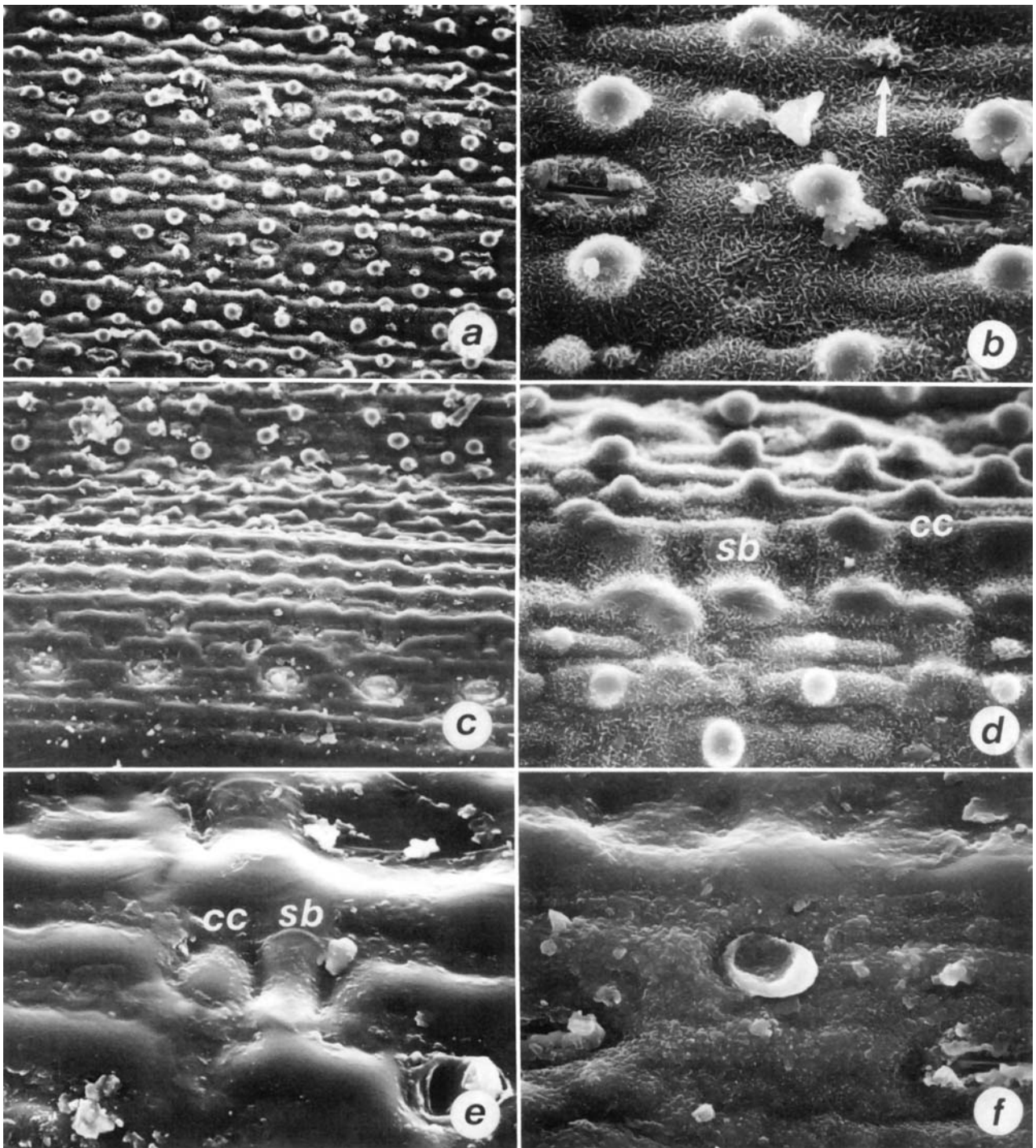


PLATE 59.—Abaxial epidermis *Chrysochloa orientalis*, Lebrum 7949: *a*, overview, $\times 295$; *b*, stomata, interstomatal cell, cork cell (arrow), $\times 1285$; *c*, overview near margin, $\times 295$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, intercostal silica body (sb), cork cell (cc), $\times 1285$; *f*, microhair, $\times 1285$.

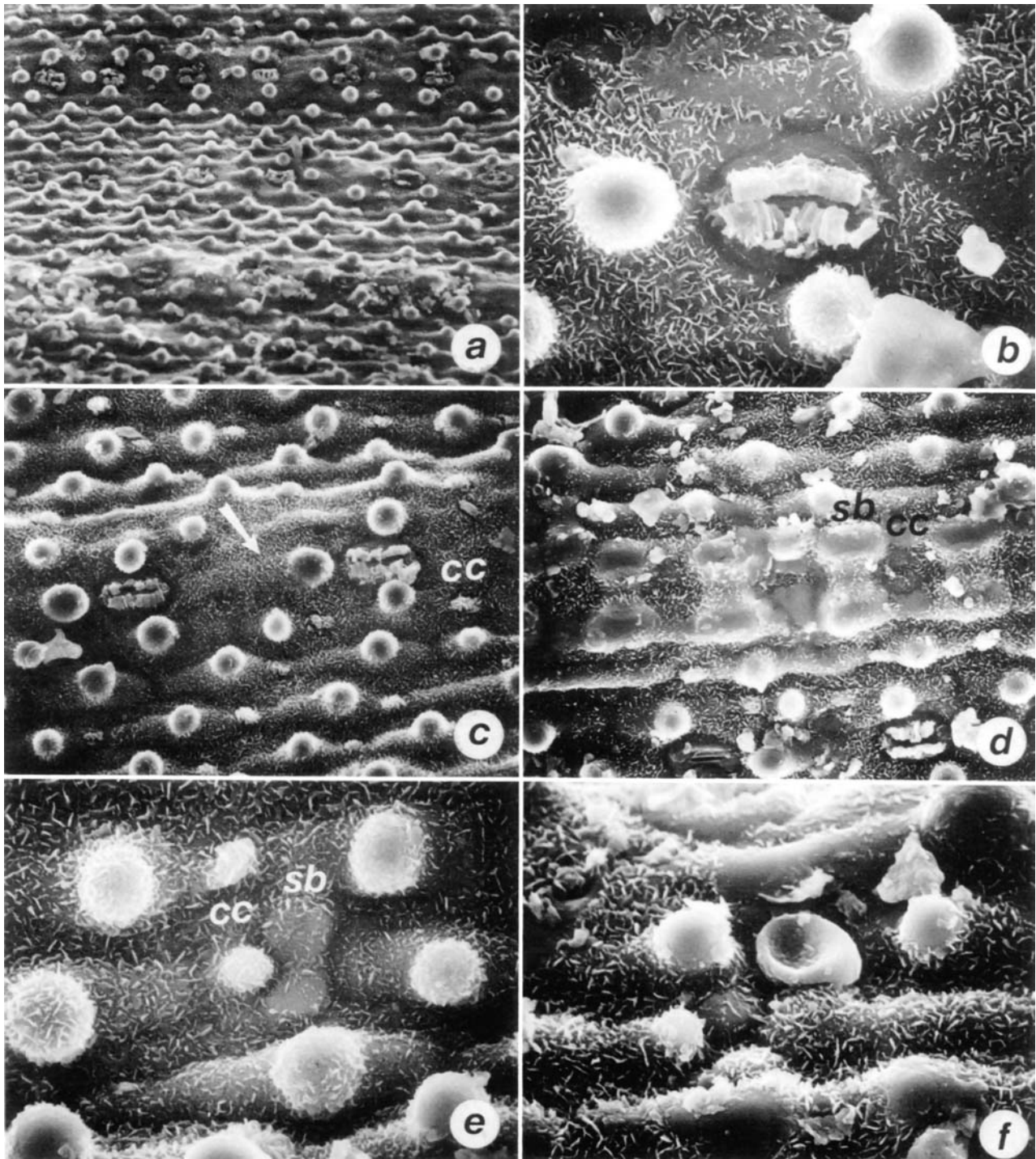


PLATE 60.—Adaxial epidermis *Chrysochloa orientalis*, Lebrum 7949: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), long cells, intercostal cork cells (cc), $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 625$; *e*, intercostal silica body (sb), cork cell (cc), $\times 1696$; *f*, microhair, $\times 1696$.

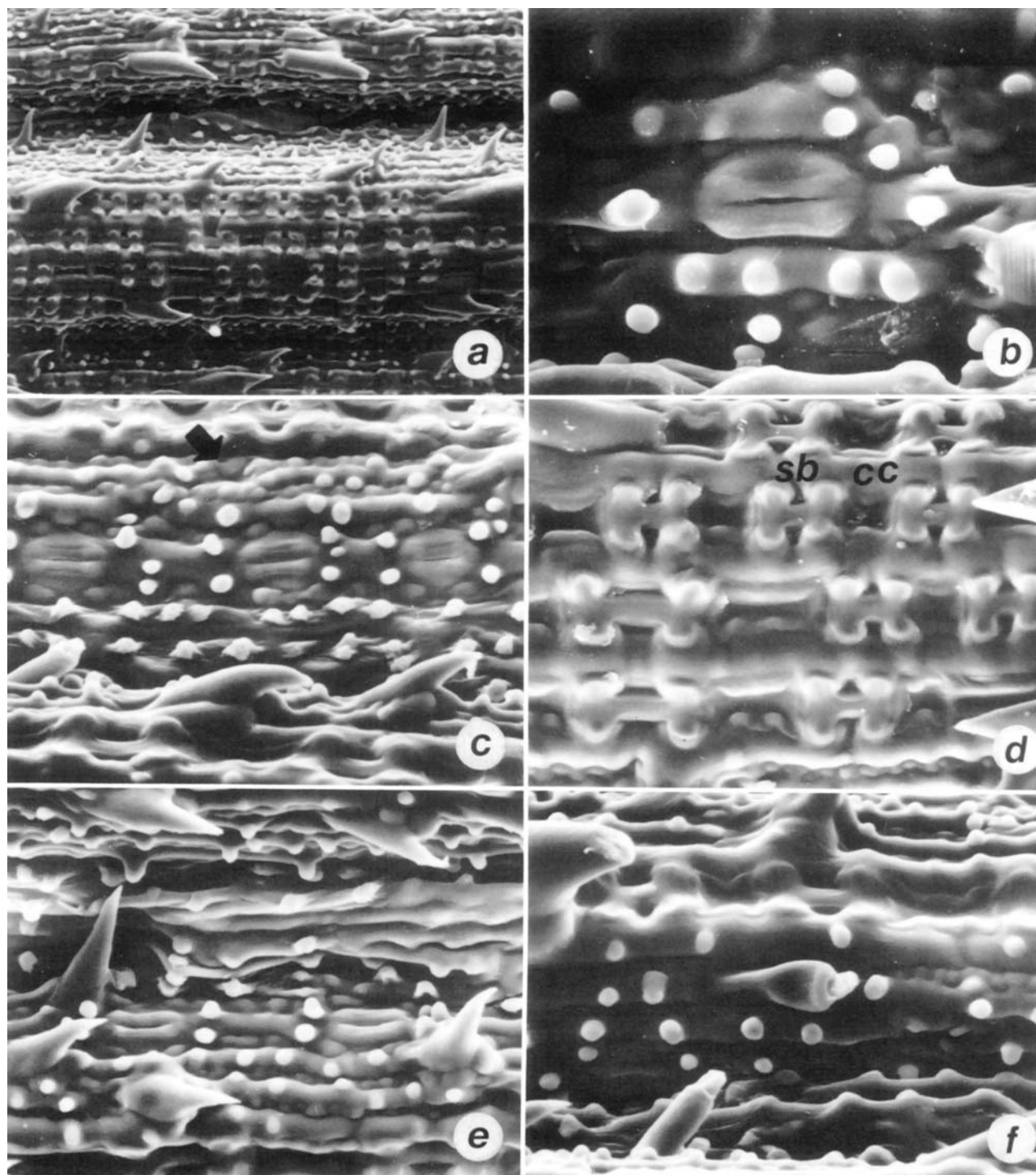


PLATE 61.—Abaxial epidermis *Ctenium somalense*, J. Hill 312: *a*, overview, $\times 240$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, intercostal cork cells (arrow), $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, intercostal prickles, interstomatal cells, $\times 640$; *f*, microhair, $\times 768$.

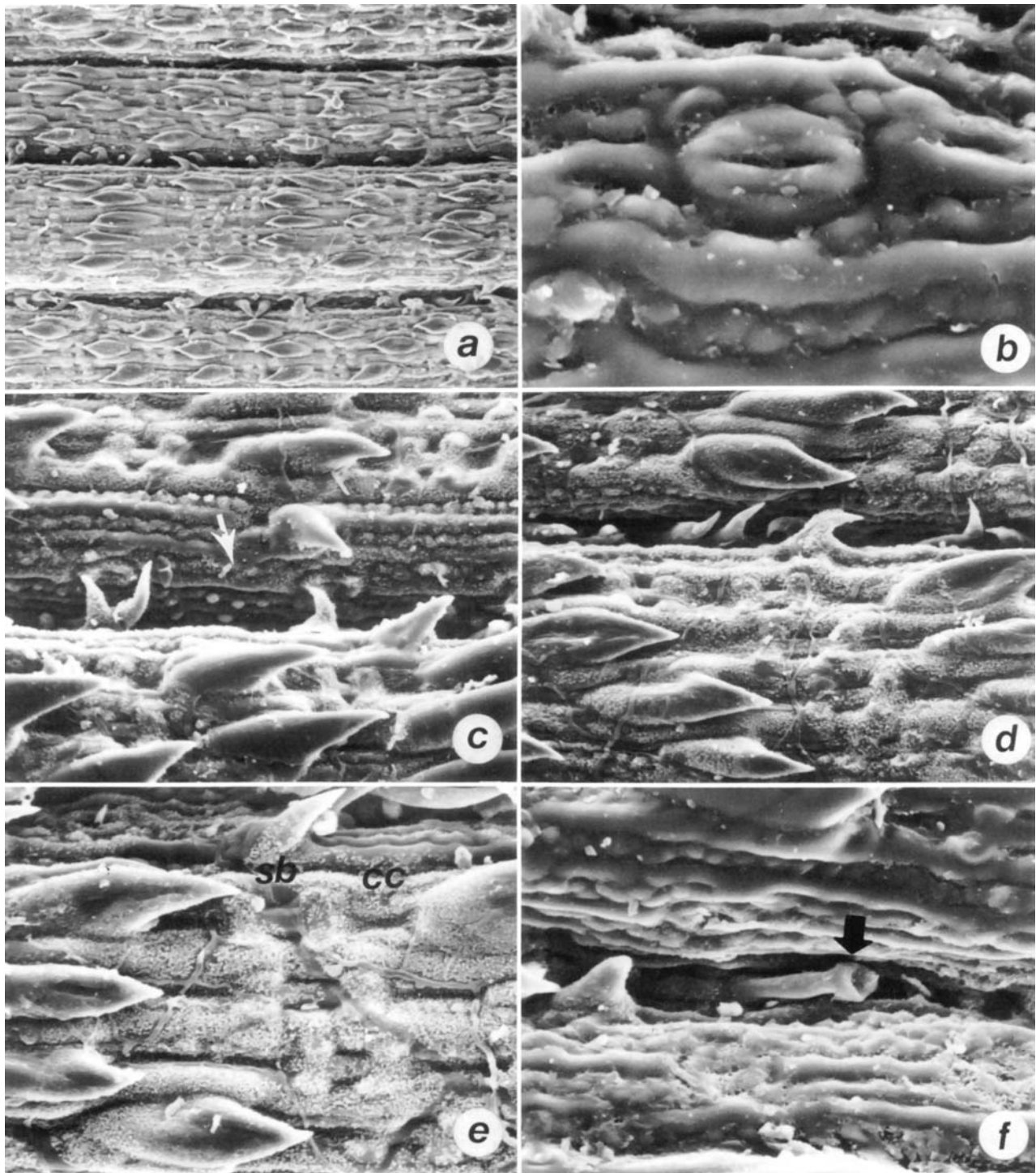


PLATE 62.—Adaxial epidermis *Ctenium somalense*, J. Hill 312: *a*, overview, $\times 160$; *b*, stoma, $\times 1500$; *c*, interstomatal cells (arrow), long cells, $\times 480$; *d*, intercostal prickles, $\times 480$; *e*, costal silica bodies (sb), cork cells (cc), $\times 640$; *f*, microhair (arrow), $\times 768$.

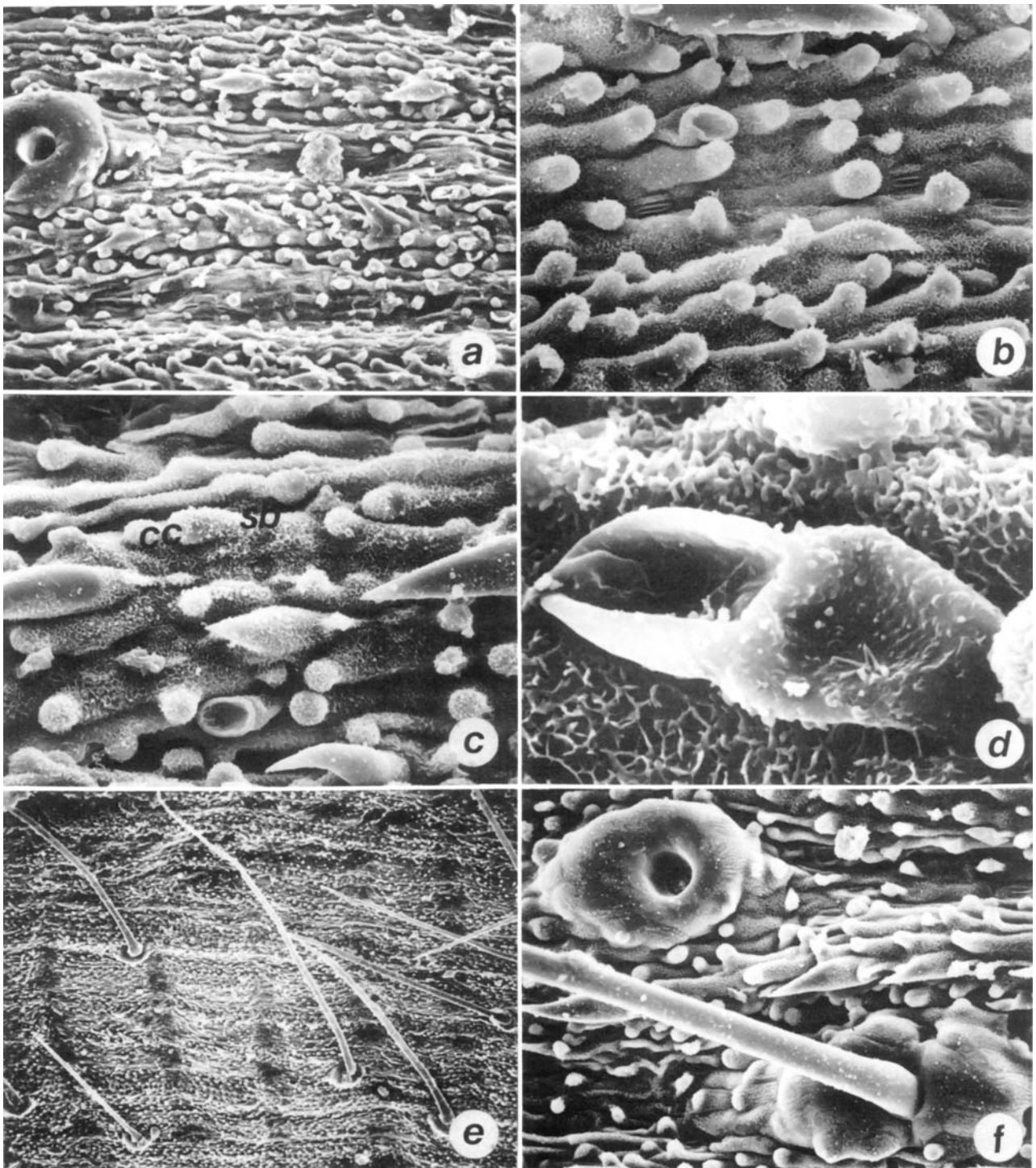


PLATE 63.—Abaxial epidermis *Cynodon plectostachyus*, Verdcourt 2190: *a*, overview, $\times 295$; *b*, stomata, interstomatal cells, $\times 867$; *c*, long cells, silica bodies (sb), cork cells (cc), prickles, $\times 867$; *d*, microhair, $\times 4290$; *e*, overview with macrohairs, $\times 80$; *f*, base of macrohair, $\times 416$.

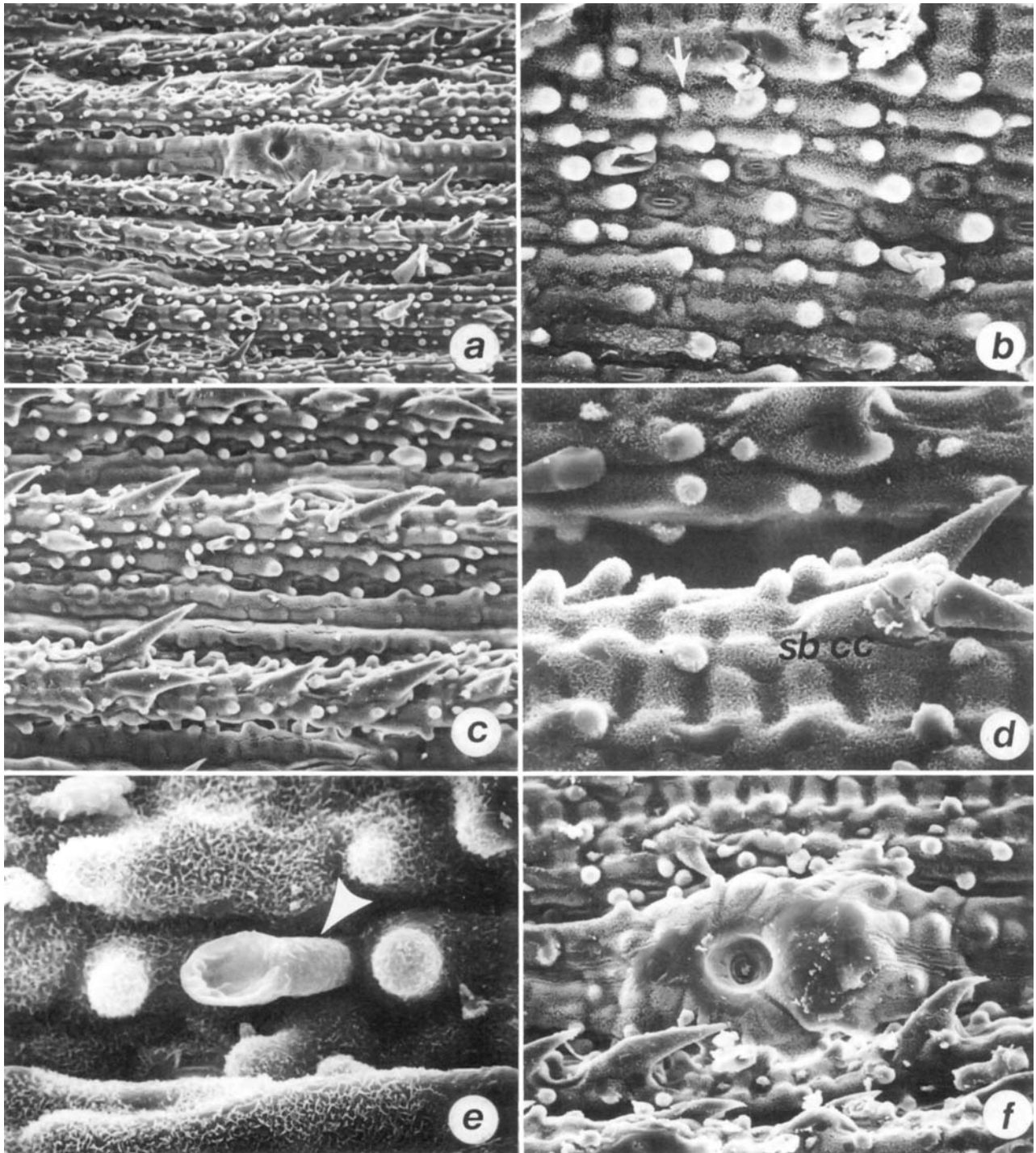


PLATE 64.—Adaxial epidermis *Cynodon plectostachyus*, Verdcourt 2190: *a*, overview, $\times 161$; *b*, stomata, interstomatal cells, long cells, intercostal papillate cork cells (arrow), $\times 625$; *c*, long cells, prickles, $\times 295$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, microhair (arrow), $\times 1696$; *f*, base of macrohair, $\times 416$.

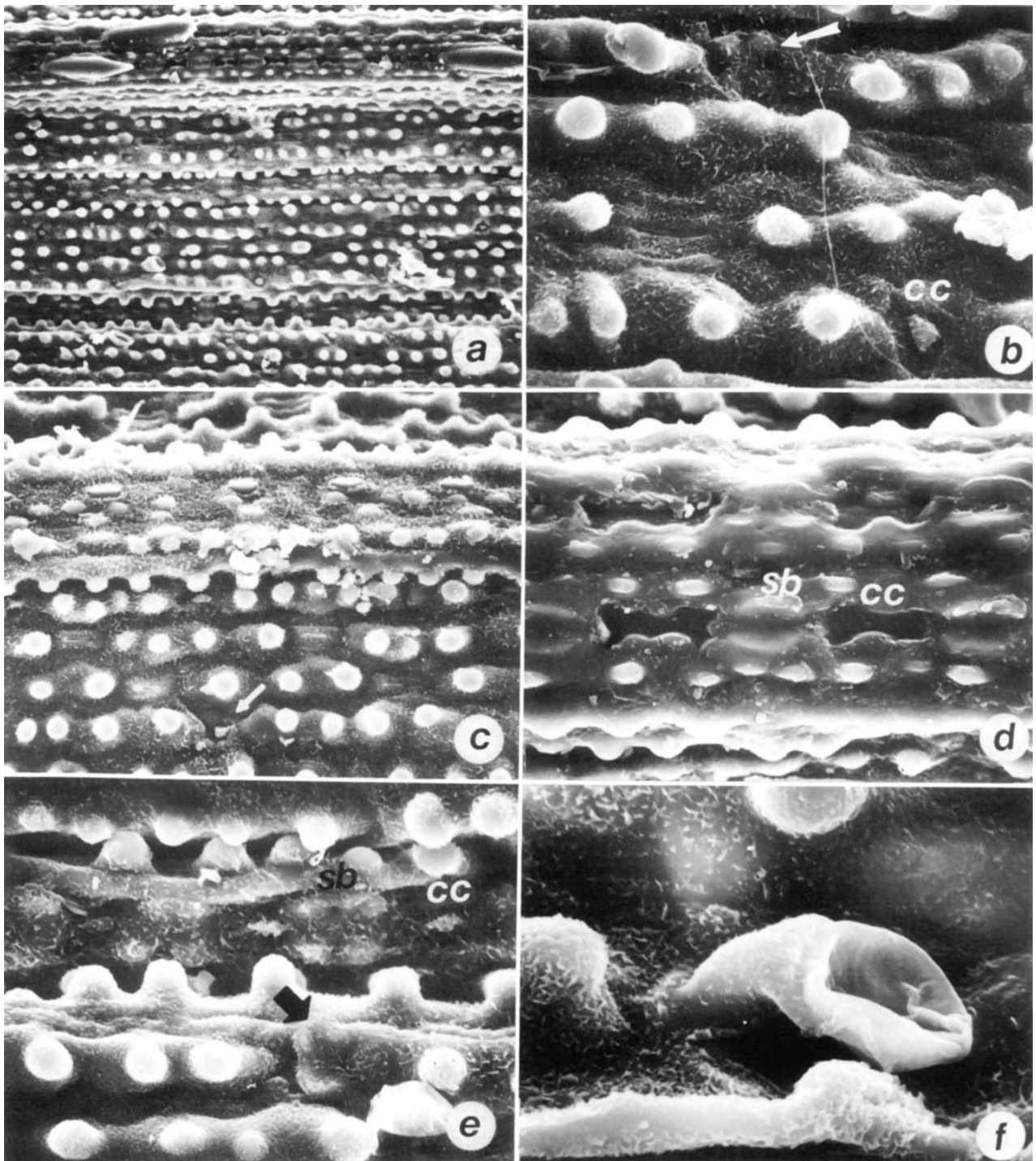


PLATE 65.—Abaxial epidermis *Daknopholis boivinii*, Croat 30897: *a*, overview, $\times 295$; *b*, stomata, interstomatal cell, intercostal silica body (arrow), cork cell (cc), $\times 1285$; *c*, long cells, intercostal cork cells (arrow), $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *e*, costal silica bodies (sb), cork cells (cc), intercostal silica body (arrow), $\times 1285$; *f*, microhair, $\times 2970$.

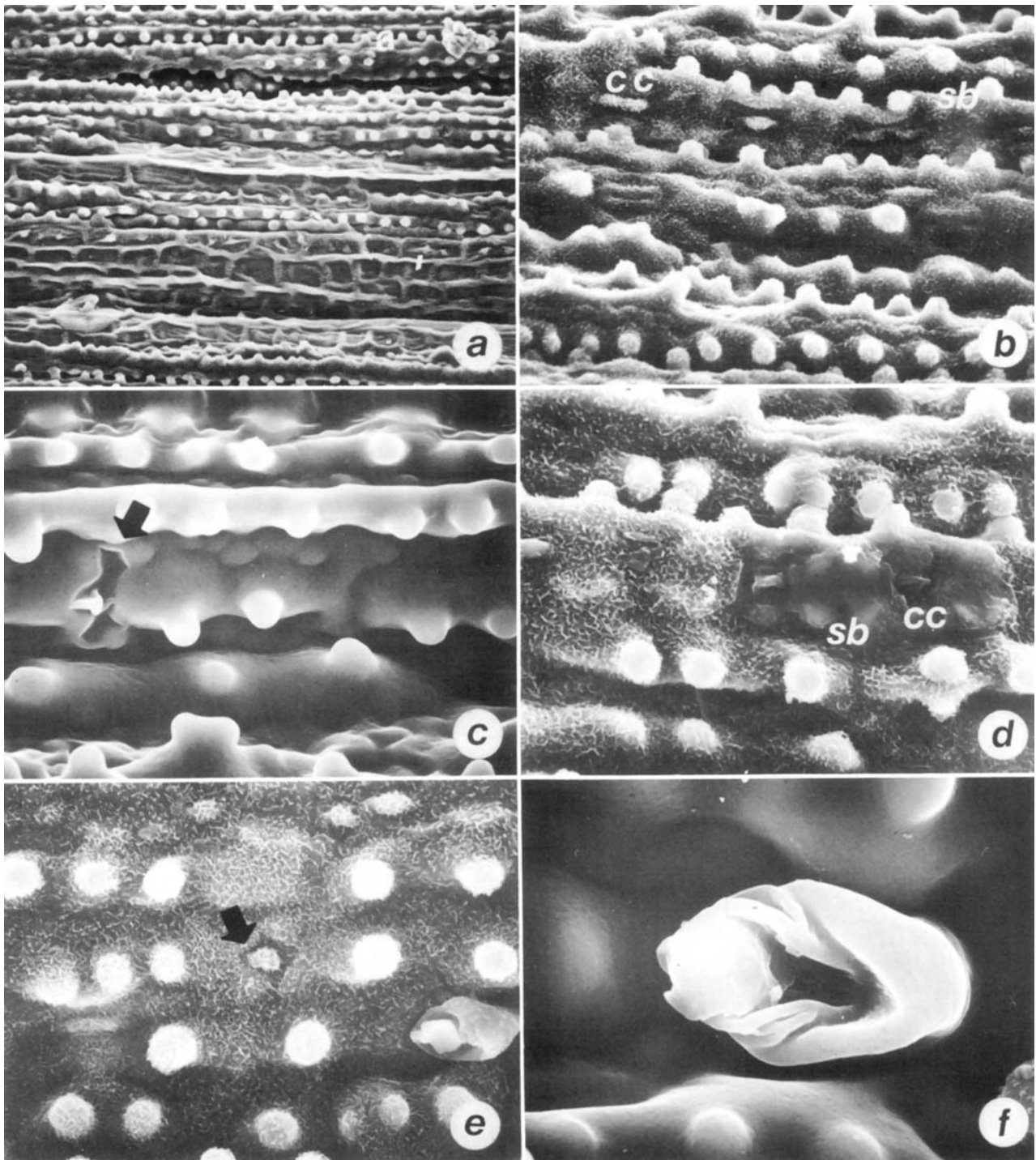


PLATE 66.—Adaxial epidermis *Daknopholis boivinii*, Croat 30897: *a*, overview, $\times 295$; *b*, stomata, interstomatal cells, costal silica bodies (sb), cork cells (cc), $\times 867$; *c*, long cells, intercostal cork cell (arrow), $\times 1285$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *e*, intercostal cork cell (arrow), $\times 1285$; *f*, microhair, $\times 2970$.

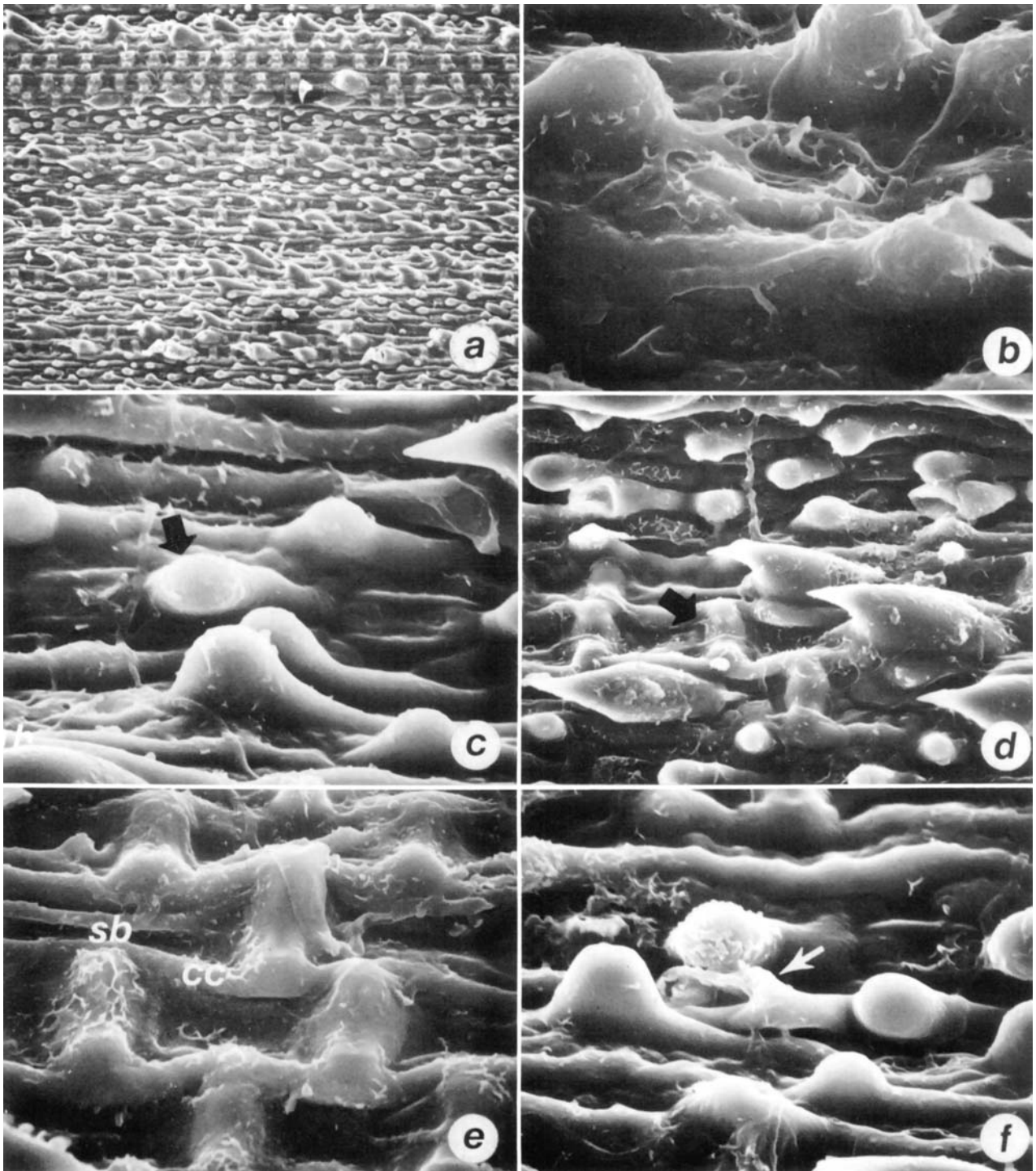


PLATE 67.—Abaxial epidermis *Enteropogon macrostachyus*, Faden 74/1146: *a*, overview, $\times 161$; *b*, stoma, $\times 2970$; *c*, interstomatal cell (arrow), $\times 1696$; *d*, costal prickles, silica bodies (arrow), $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1696$; *f*, microhair (arrow), $\times 1696$.

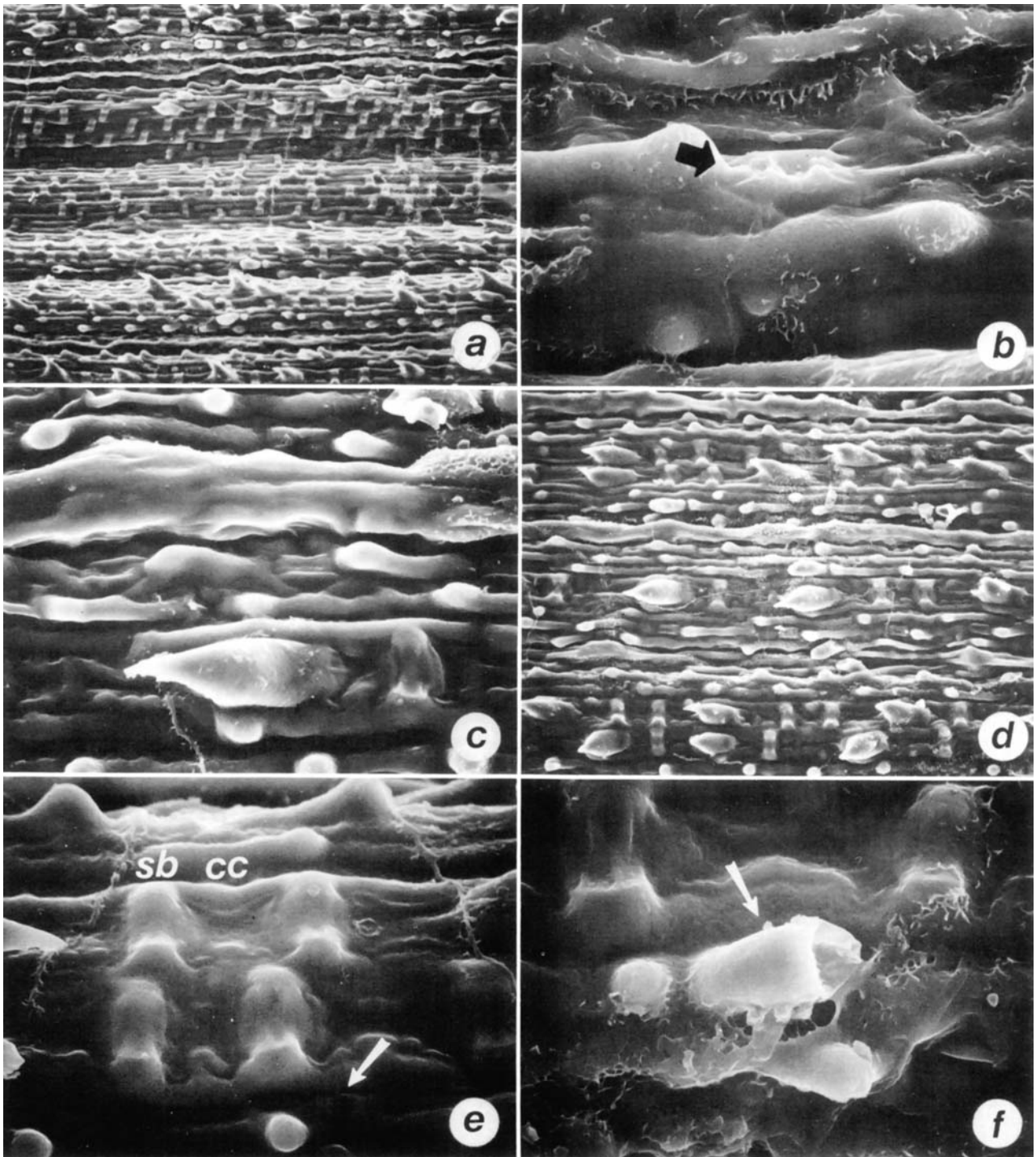


PLATE 68.—Adaxial epidermis *Enteropogon macrostachyus*, Faden 74/1146: *a*, overview, $\times 161$; *b*, stoma (arrow), $\times 1696$; *c*, interstomatal and long cells, $\times 867$; *d*, costal prickles, $\times 295$; *e*, costal silica bodies (sb), cork cells (cc), intercostal cork cells (arrow), $\times 1285$; *f*, microhair (arrow), $\times 1696$.

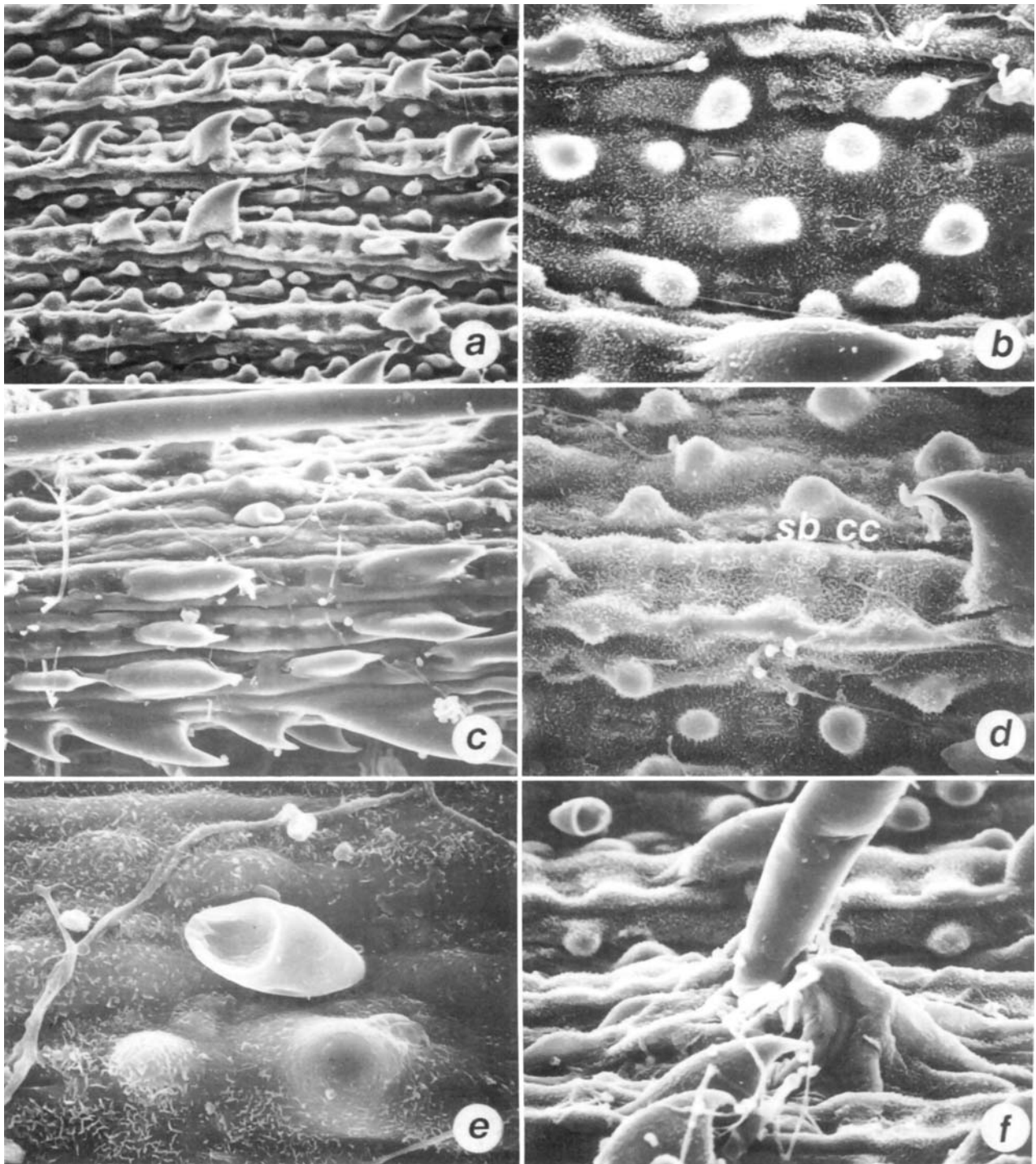


PLATE 69.—Abaxial epidermis *Eustachys paspaloides*, Magogo and Glover 372: *a*, overview, $\times 295$; *b*, stomata, interstomatal cells, $\times 867$; *c*, long cells, costal prickles, $\times 416$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, microhair, $\times 1696$; *f*, base of macrohair, $\times 625$.

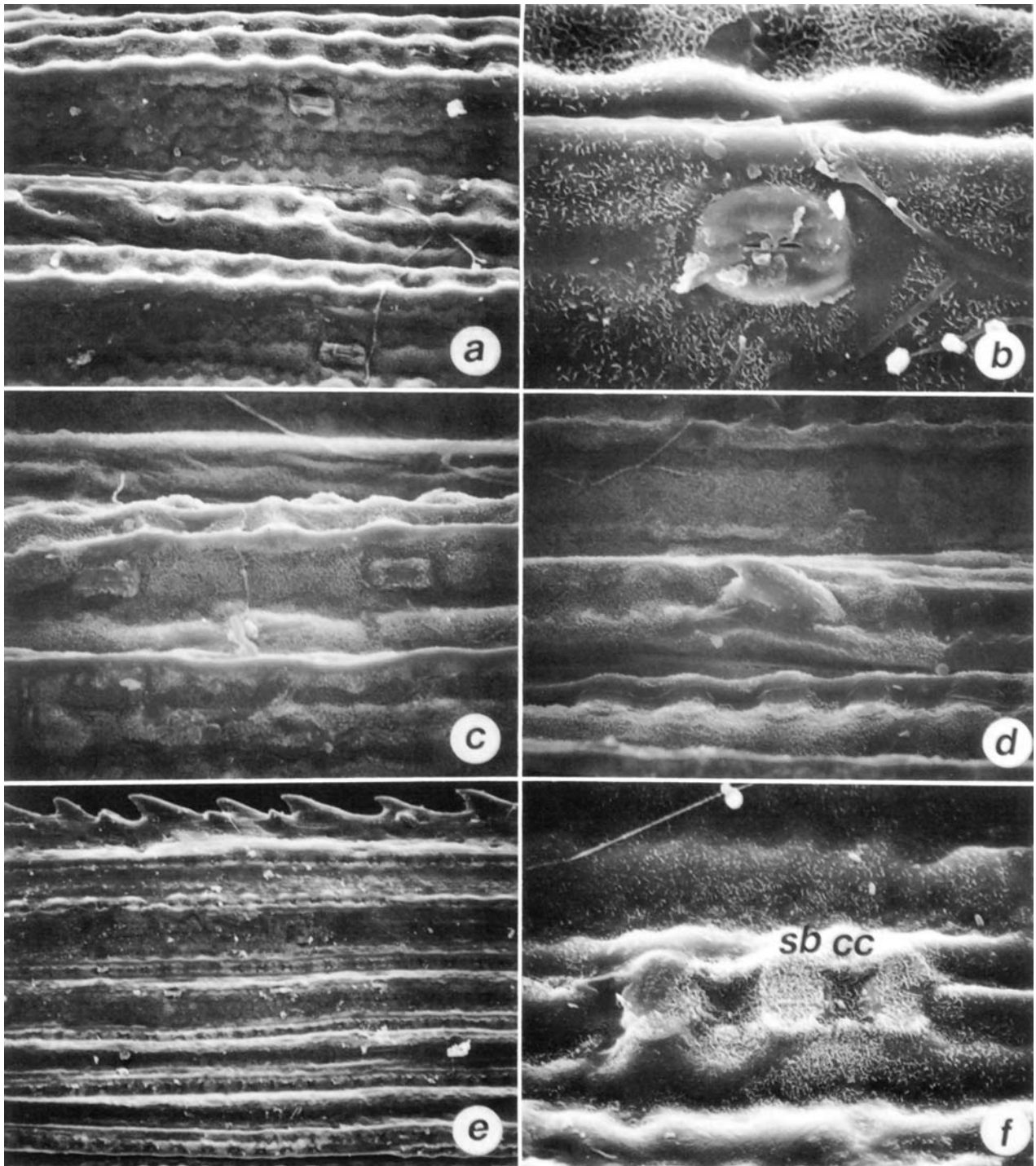


PLATE 70.—Adaxial epidermis *Eustachys paspaloides*, Magogo and Glover 372: *a*, overview, $\times 416$; *b*, stoma, $\times 1285$; *c*, interstomatal cell, $\times 625$; *d*, costal prickle, $\times 625$; *e*, marginal prickles, $\times 161$; *f*, costal silica bodies (sb), cork cells (cc), $\times 867$.

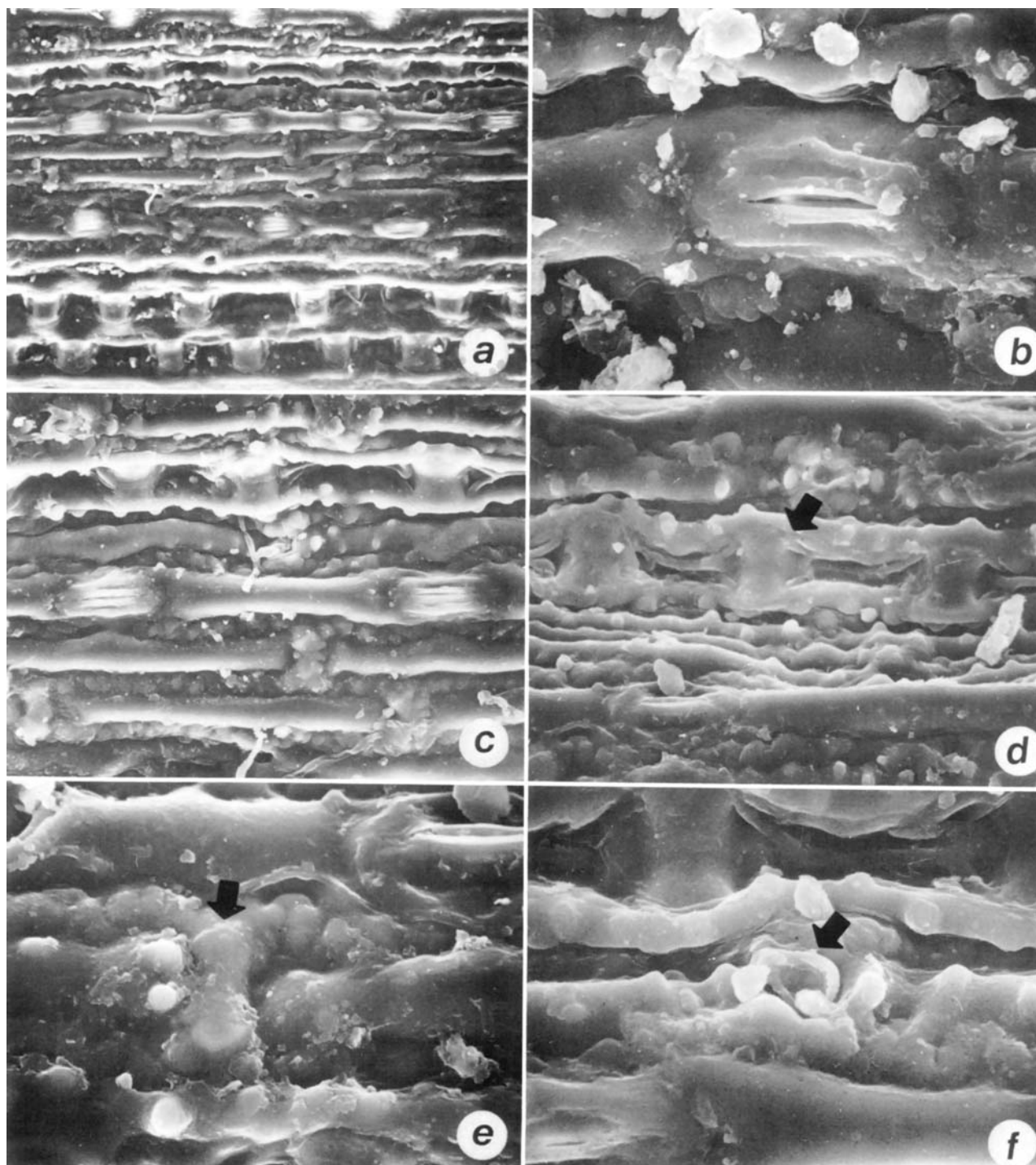


PLATE 71.—Abaxial epidermis *Microchloa kunthii*, Gilbert and Thulin 823: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, stomata, interstomatal cell, $\times 625$; *d*, costal silica bodies (arrow), $\times 867$; *e*, intercostal silica body (arrow), $\times 1696$; *f*, microhair (arrow), $\times 1696$.

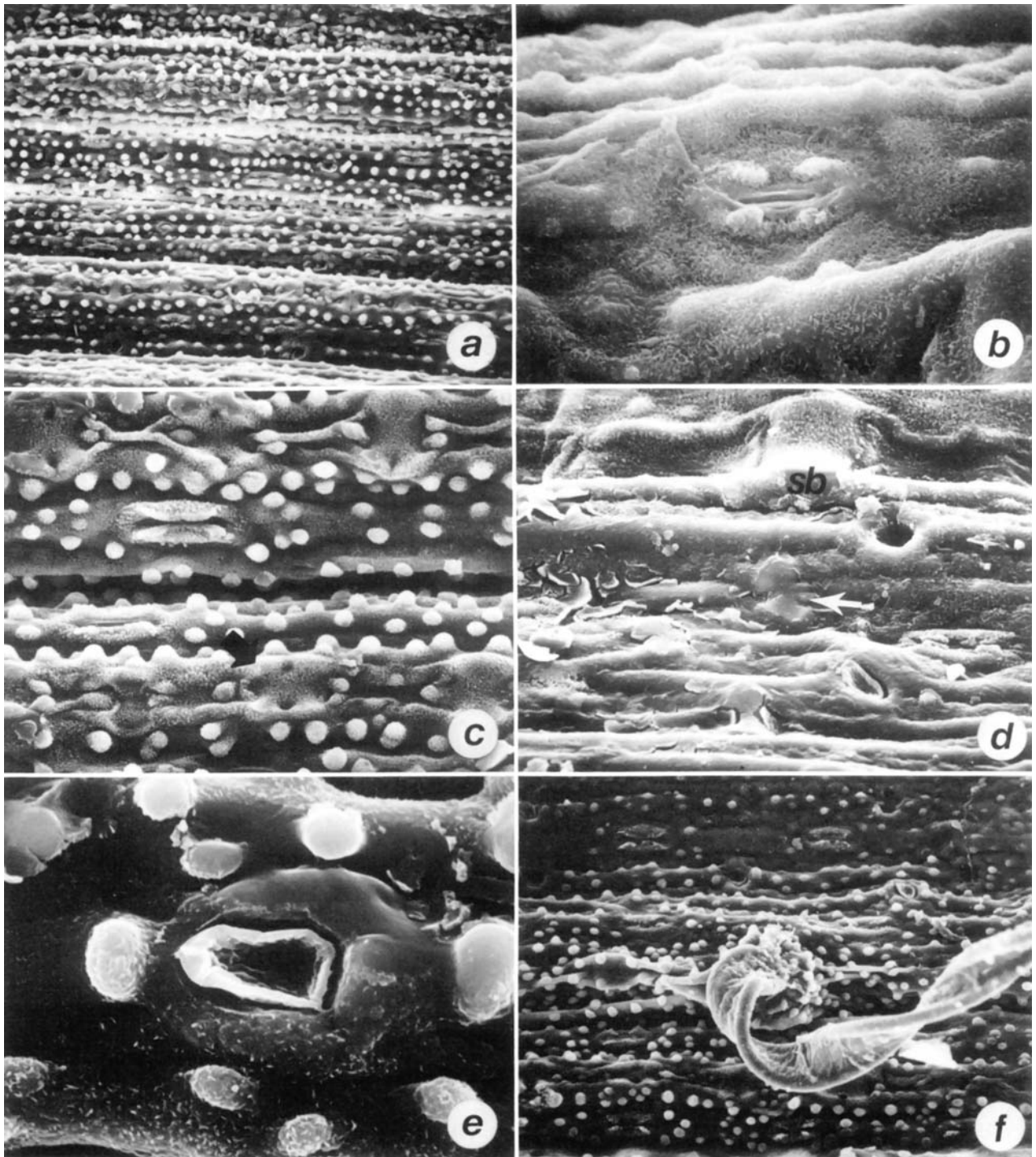


PLATE 72.—Adaxial epidermis *Microchloa kunthii*, Gilbert and Thulin 823: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell, long cells, silica bodies (arrow), $\times 867$; *d*, costal silica body (sb), intercostal silica body (arrow), $\times 867$; *e*, microhair surrounded by raised cells, $\times 2970$; *f*, twisted macrohair, $\times 416$.

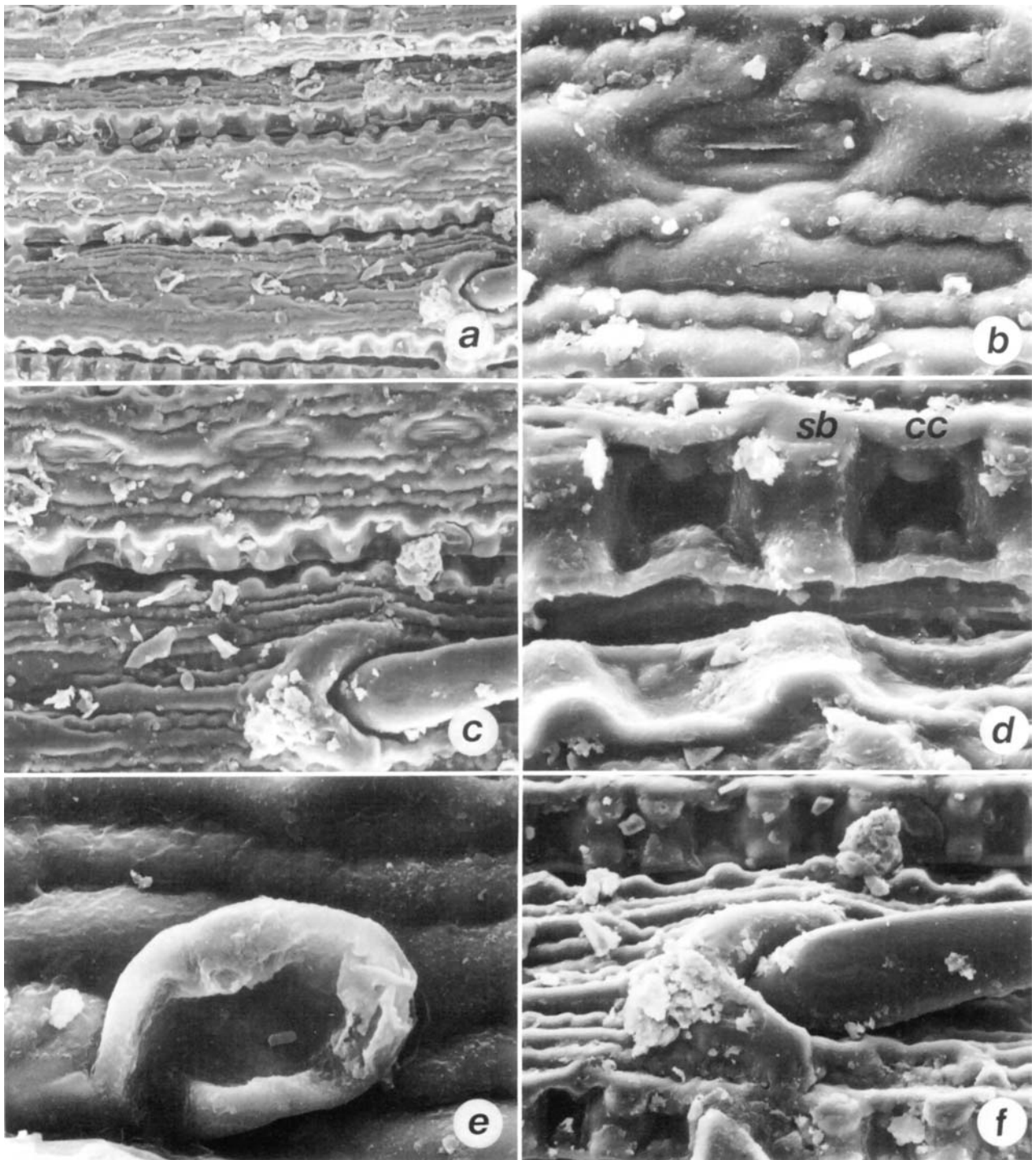


PLATE 73.—Abaxial epidermis *Oropetium capense*, Pappi 7124: *a*, overview, $\times 240$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, macrohair, $\times 480$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1250$; *e*, microhair, $\times 2500$; *f*, macrohair, $\times 640$.

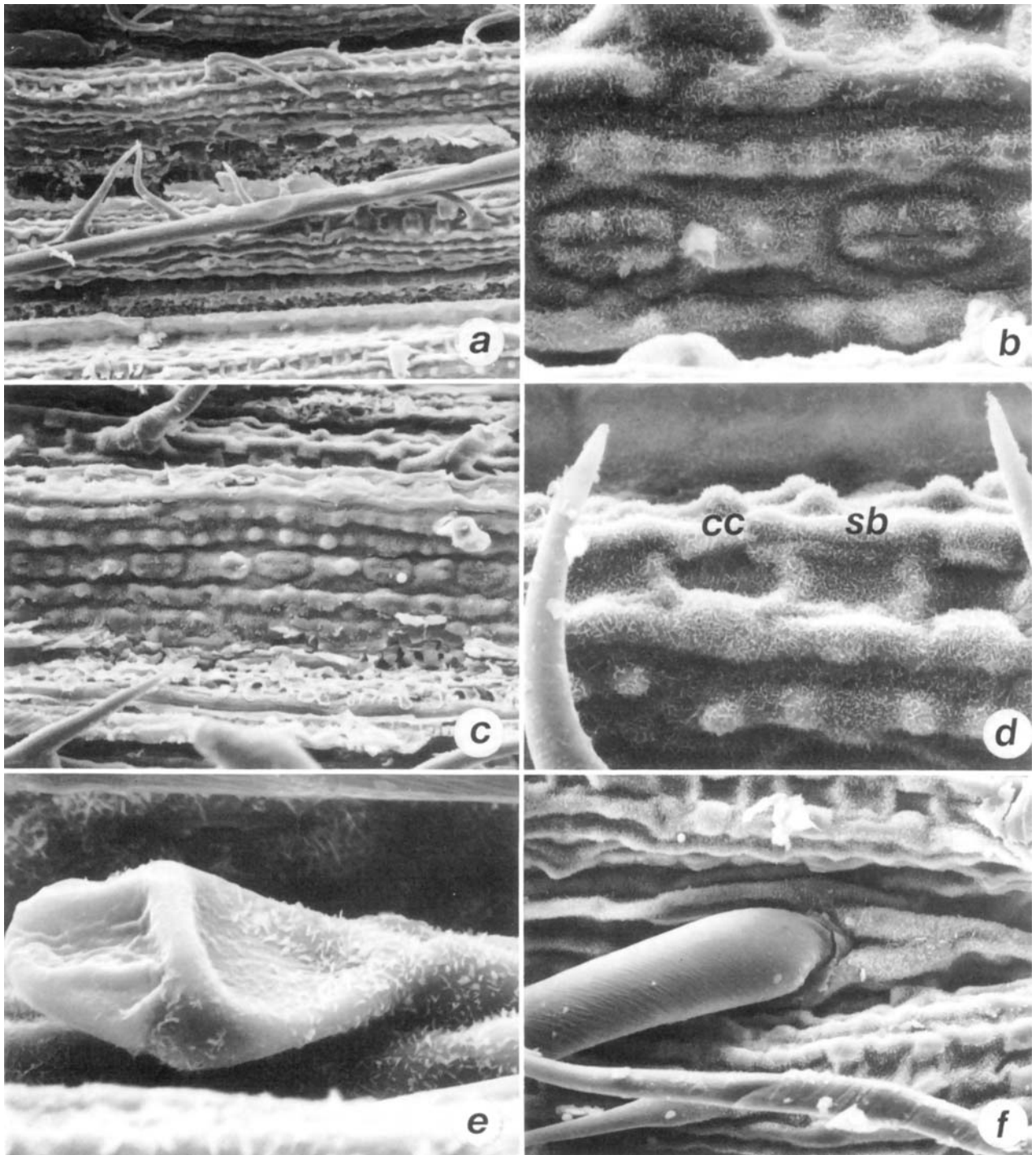


PLATE 74.—Adaxial epidermis *Oropetium capense*, Pappi 7124: *a*, overview, $\times 240$; *b*, stomata, interstomatal cell, $\times 1250$; *c*, interstomatal cells, long cells, short macrohairs, $\times 480$; *d*, costal silica bodies (sb), cork cells (cc), $\times 1250$; *e*, microhair, $\times 2500$; *f*, macrohair, $\times 640$.

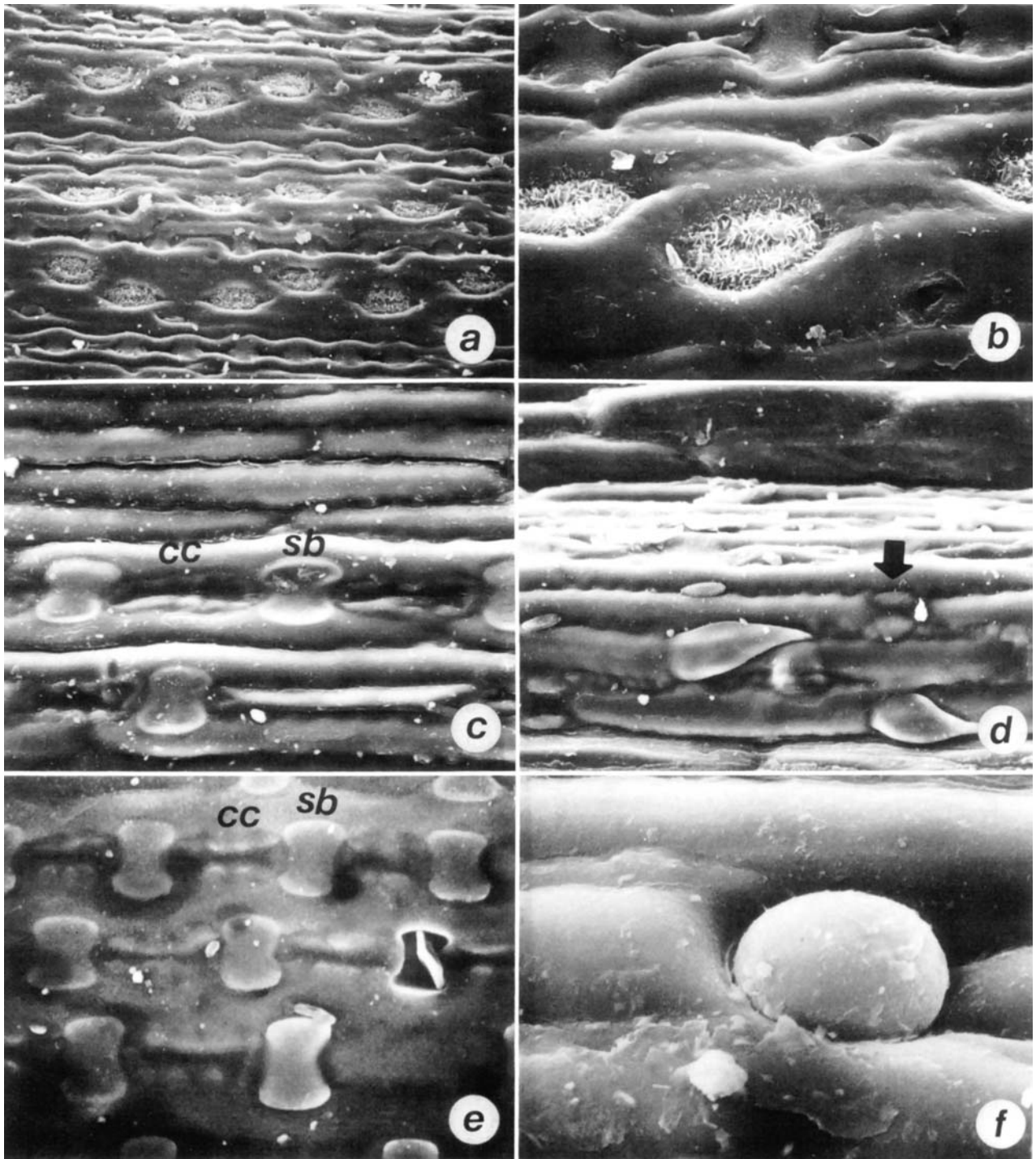


PLATE 75.—Abaxial epidermis *Rendlia altera*, Robinson 6362: *a*, overview, $\times 295$; *b*, stoma, interstomatal cell, $\times 867$; *c*, long cells, silica bodies (sb), cork cells (cc), $\times 960$; *d*, intercostal prickles, intercostal silica body (arrow), $\times 960$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 3750$.

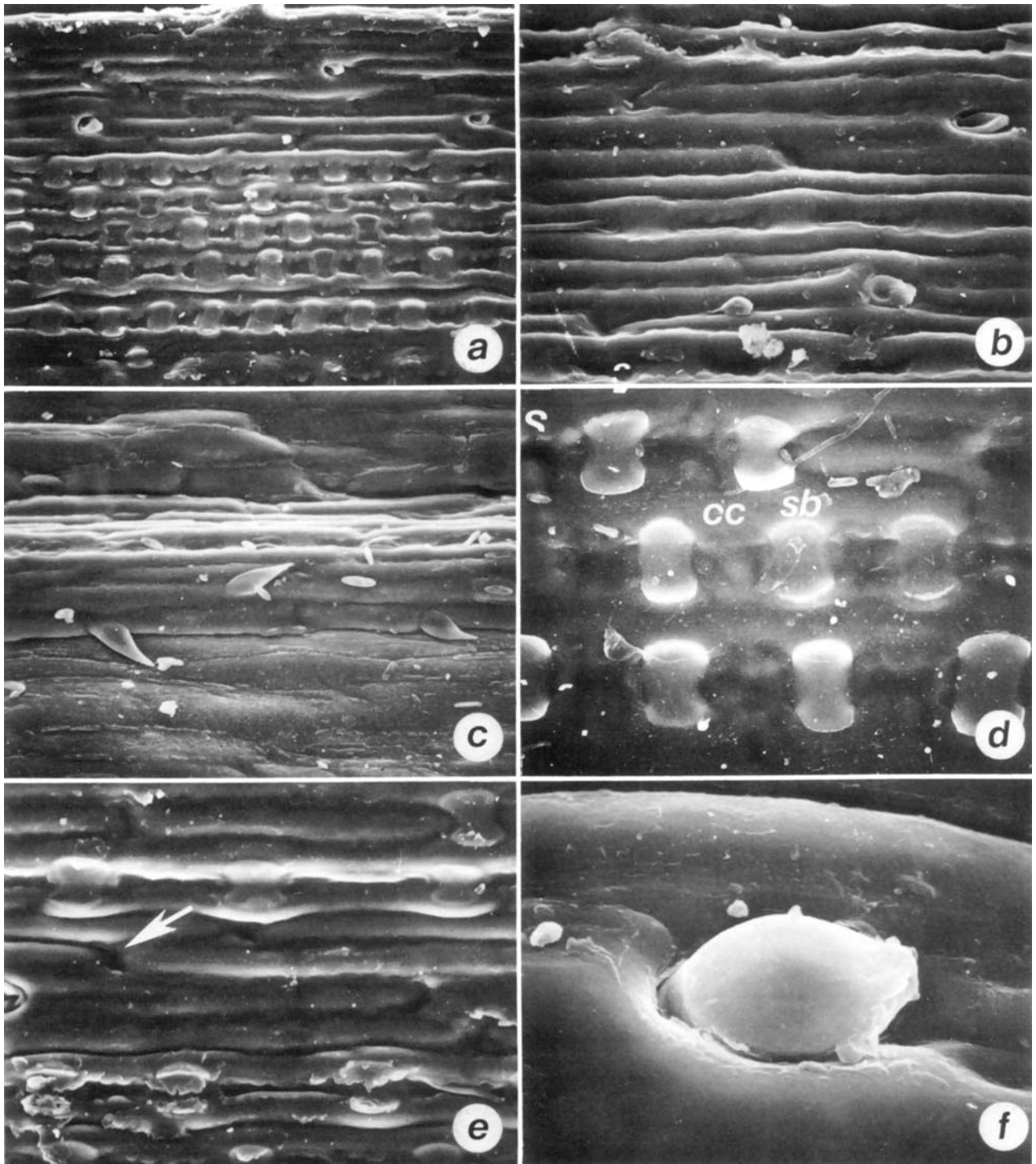


PLATE 76.—Adaxial epidermis *Rendlia altera*, Robinson 6362: *a*, overview, $\times 295$; *b*, long cells, $\times 625$; *c*, prickles, $\times 416$; *d*, costal silica bodies (sb), cork cells (cc), $\times 867$; *e*, intercostal cork cells (arrow), $\times 625$; *f*, microhair, $\times 2970$.

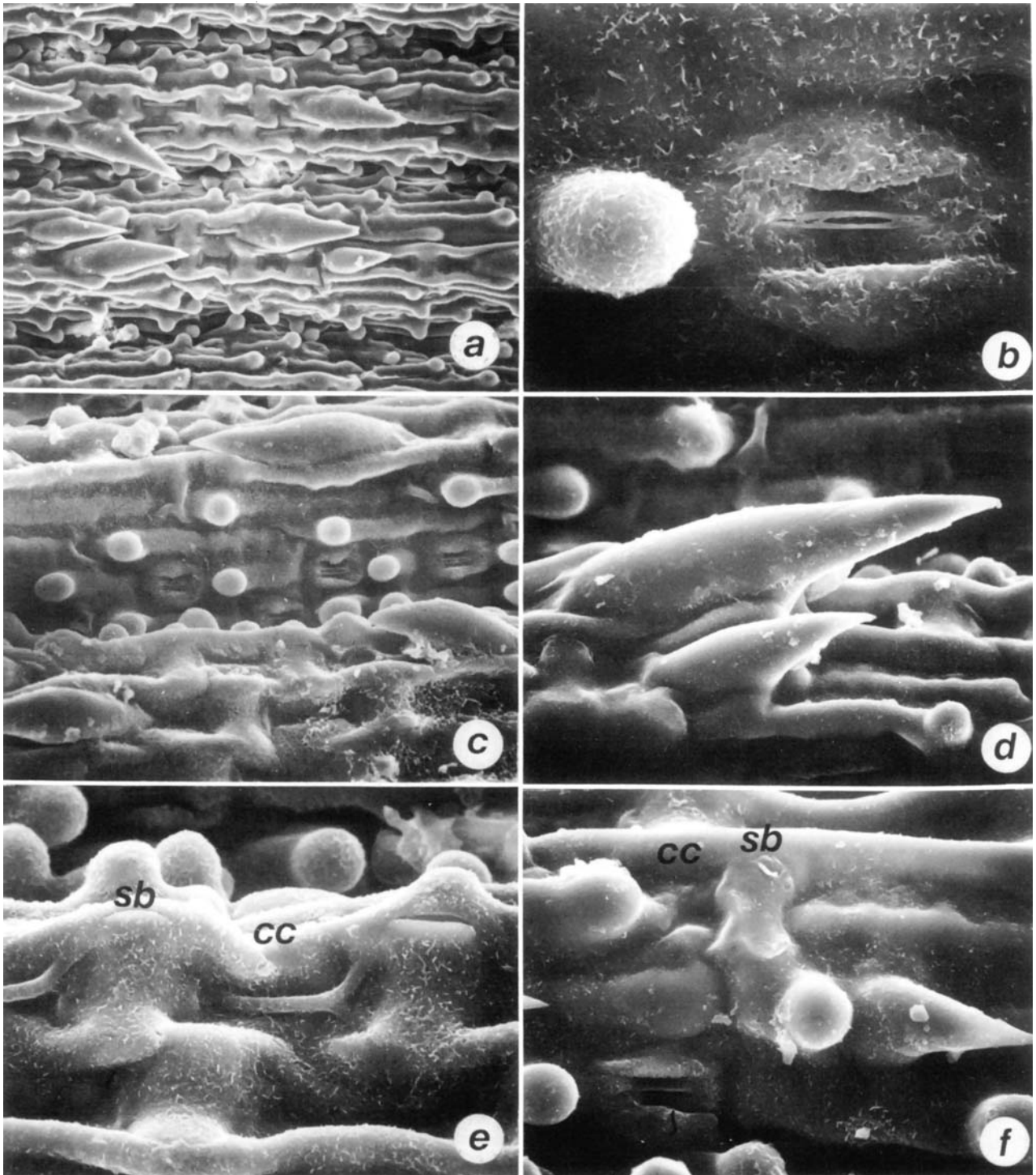


PLATE 77.—Abaxial epidermis *Schoenefeldia transiens*, Greenway 9781: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cells, long cells, $\times 625$; *d*, costal prickles, $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, intercostal silica body (sb), cork cell (cc), $\times 1285$.

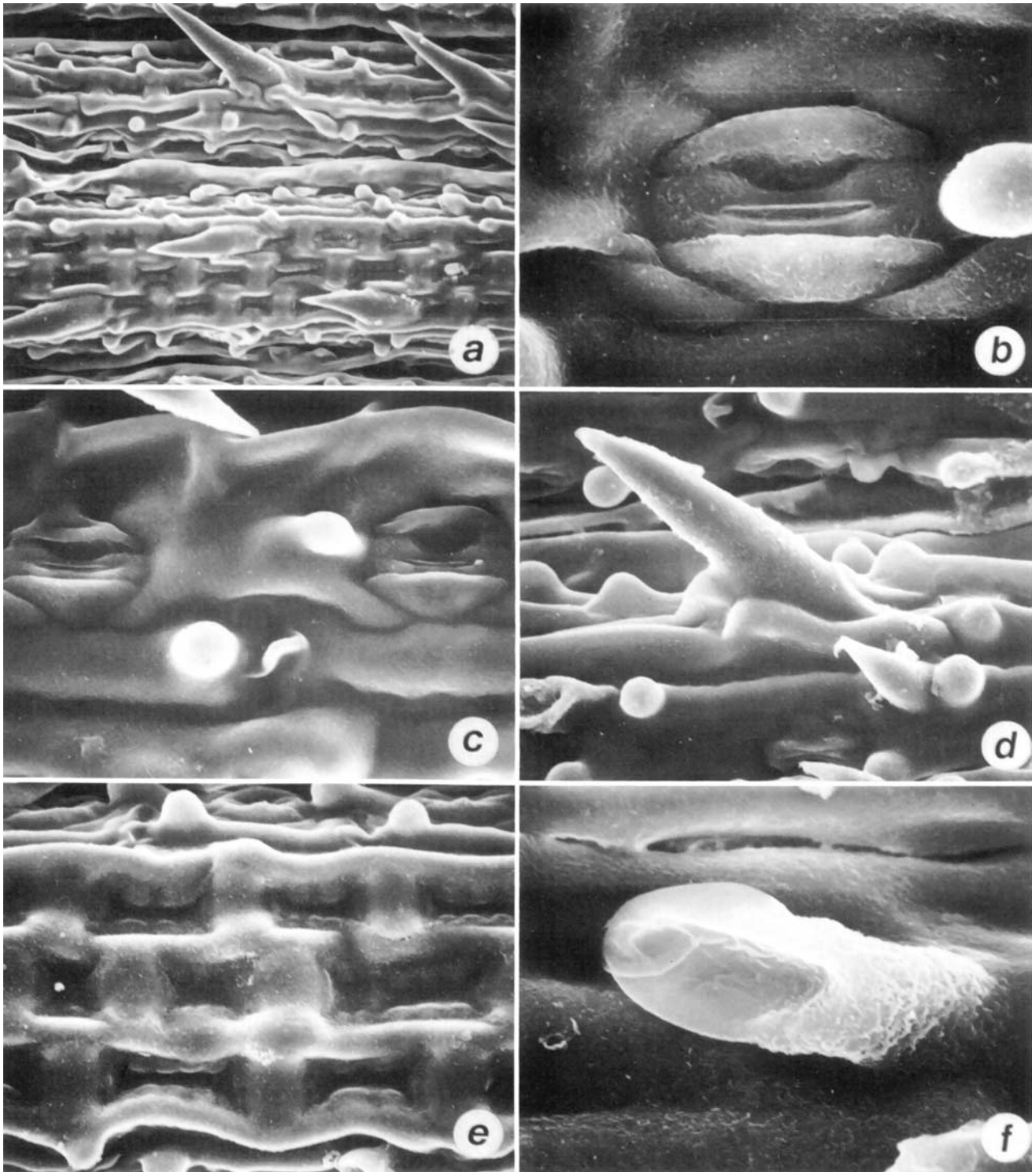


PLATE 78.—Adaxial epidermis *Schoenefeldia transiens*, Greenway 9781: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cell, $\times 1285$; *d*, costal prickle, $\times 867$; *e*, costal short cells, $\times 867$; *f*, microhair, $\times 2970$.

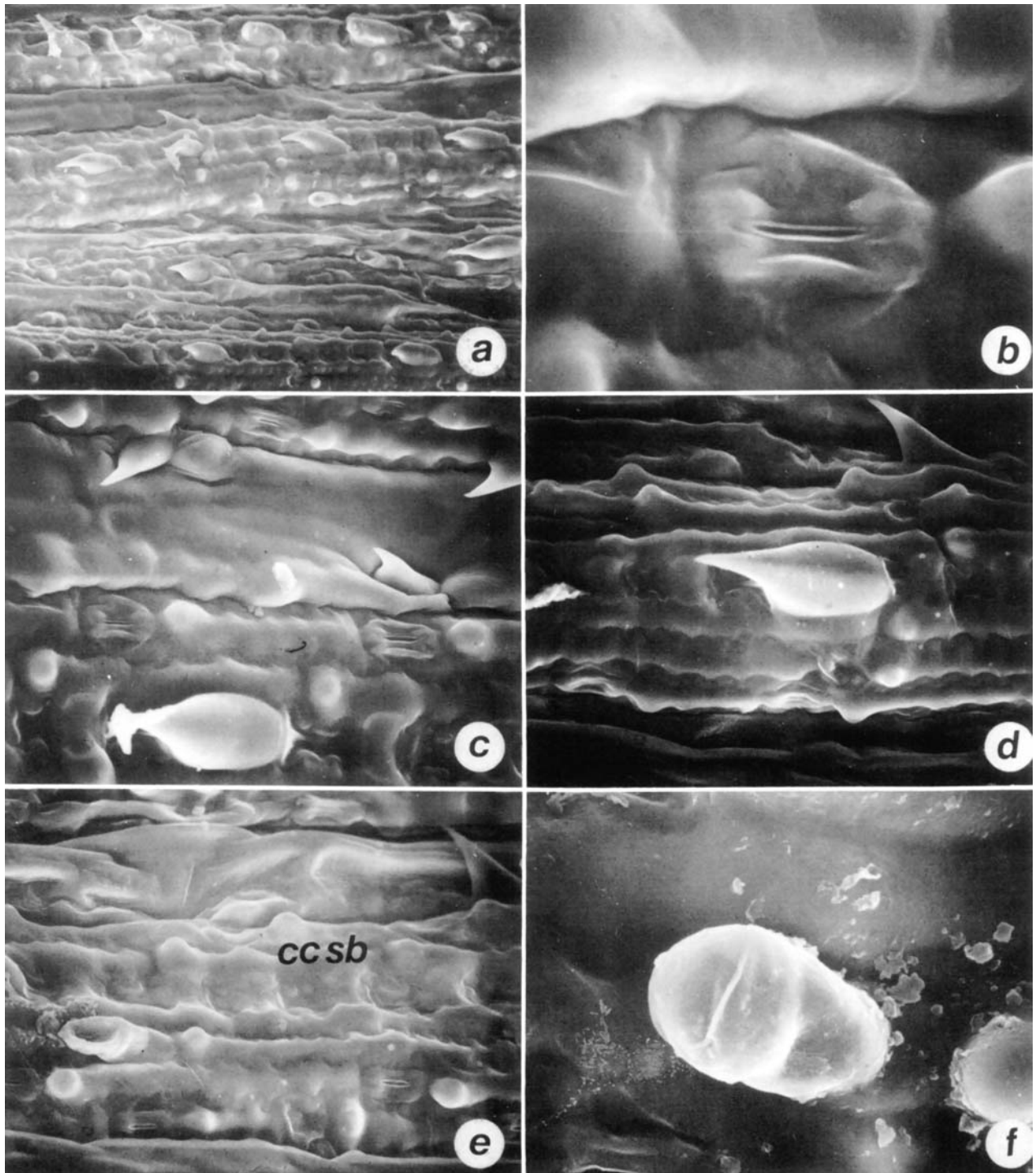


PLATE 79.—Abaxial epidermis *Tetrapogon tenellus*, Burger 623: *a*, overview, $\times 295$; *b*, stoma, $\times 2970$; *c*, interstomatal cell, $\times 867$; *d*, costal prickle, $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 867$; *f*, microhair, $\times 2970$.

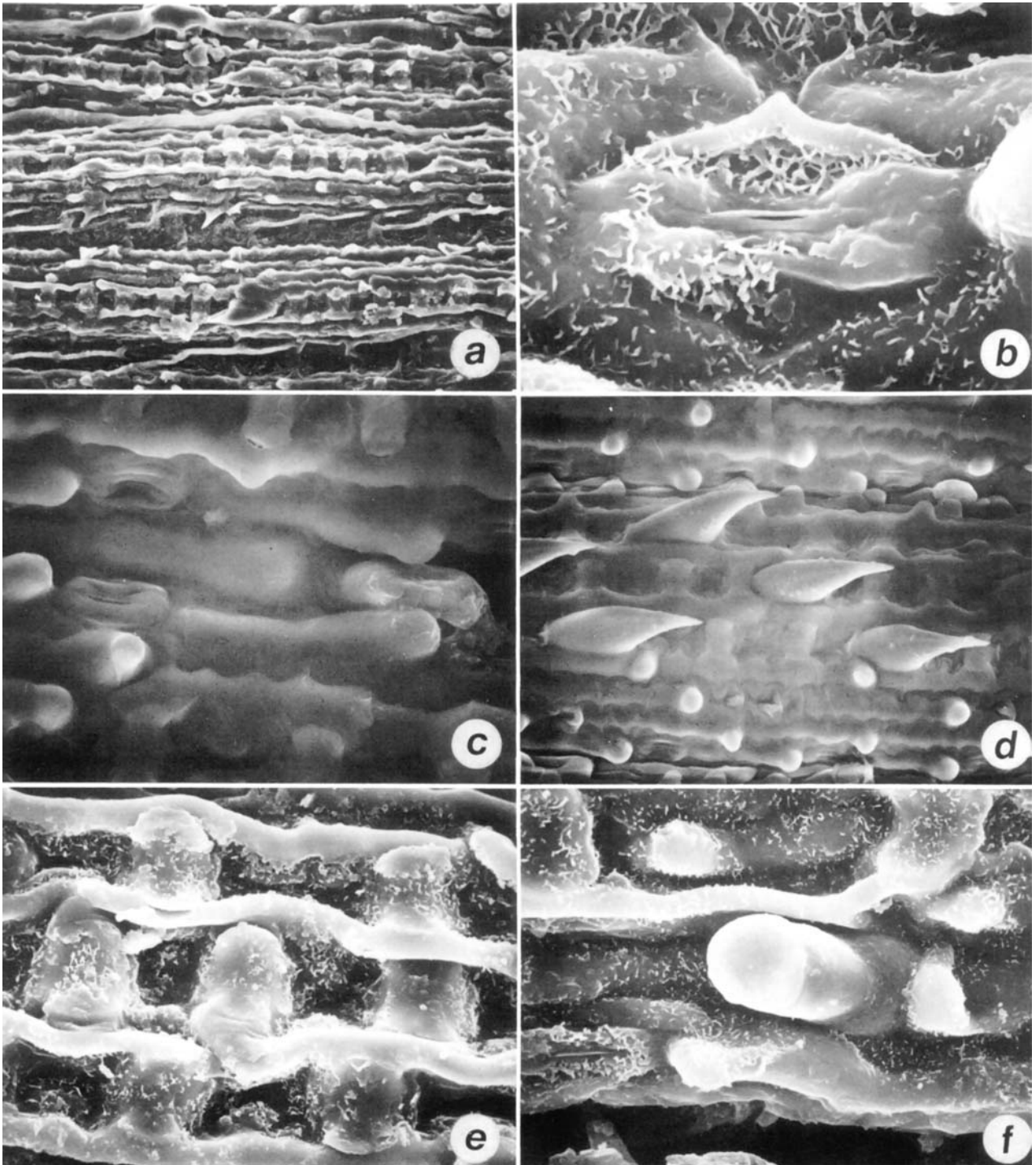


PLATE 80.—Adaxial epidermis *Tetrapogon tenellus*, Burger 623: *a*, overview, $\times 295$; *b*, stoma, $\times 4290$; *c*, interstomatal cell, $\times 1285$; *d*, prickles, $\times 625$; *e*, costal silica bodies, $\times 1285$; *f*, microhair, $\times 1696$.

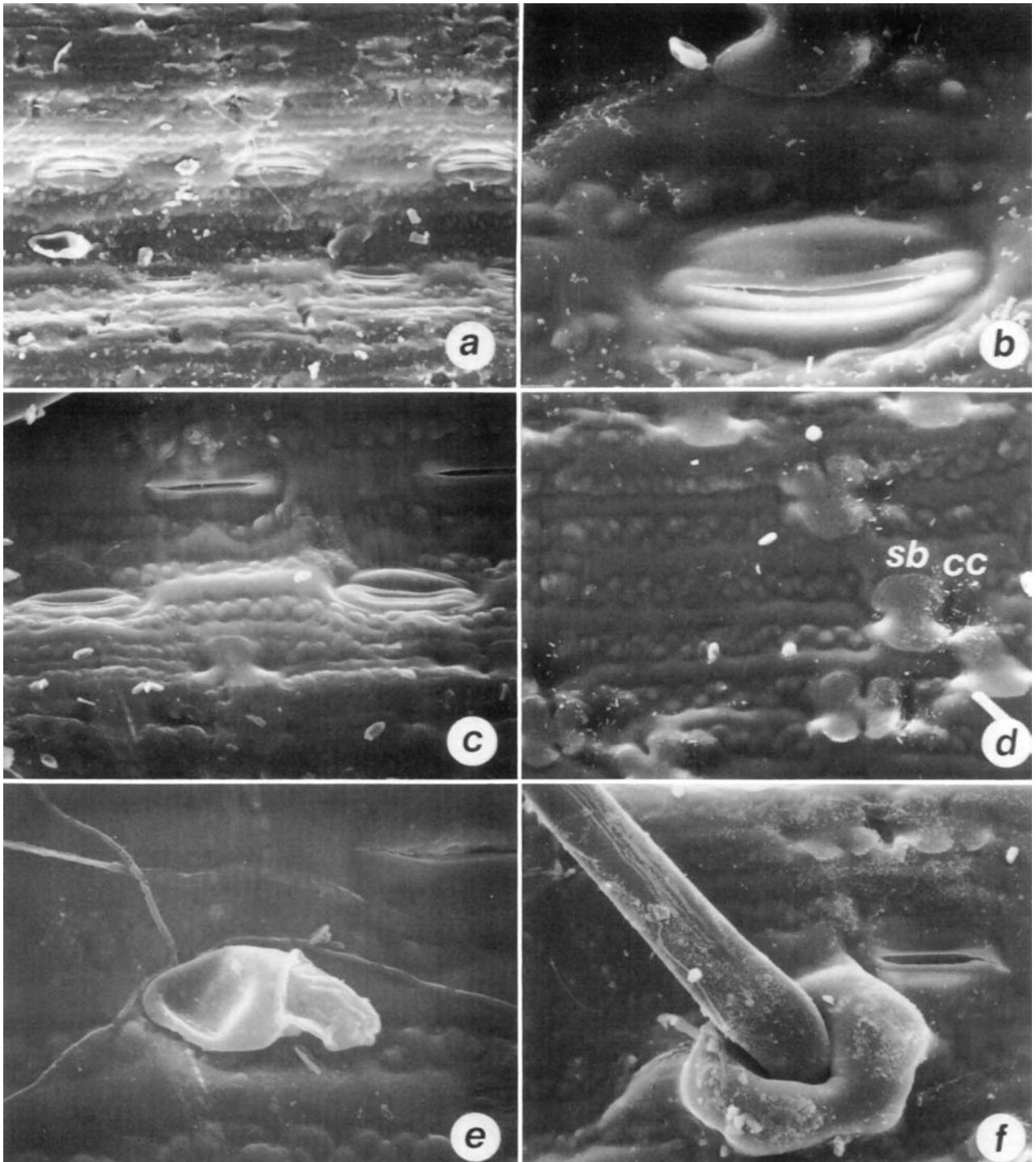


PLATE 81.—Abaxial epidermis *Crypsis schoenoides*, Chase 6983: *a*, overview, $\times 320$; *b*, stoma, $\times 1250$; *c*, interstomatal cell, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, microhair, $\times 1285$; *f*, base of macrohair, $\times 640$.

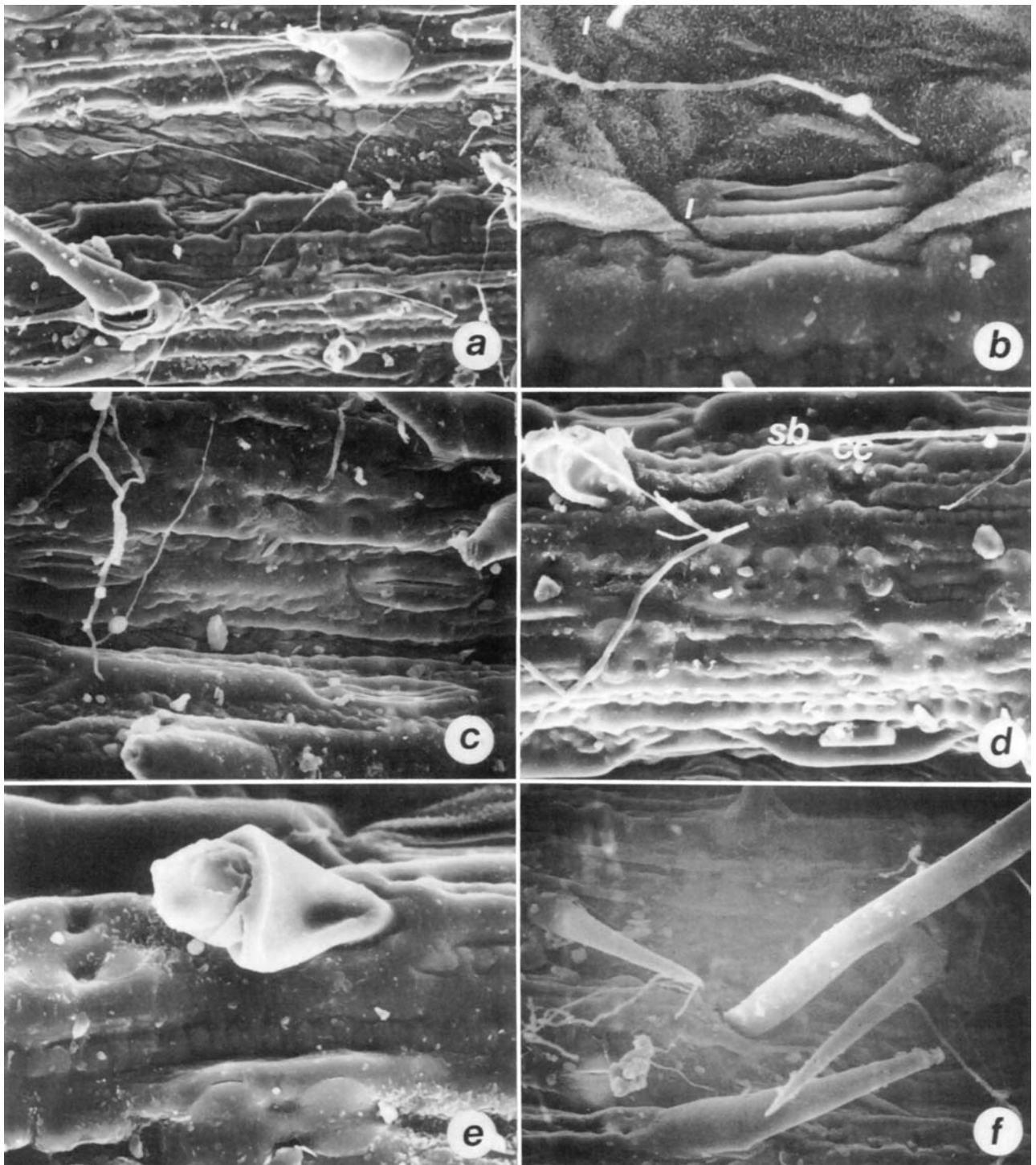


PLATE 82.—Adaxial epidermis *Crypsis schoenoides*, Chase 6983: *a*, overview, $\times 320$; *b*, stoma, $\times 1250$; *c*, interstomatal cell, $\times 625$; *d*, silica bodies (sb), cork cells (cc), $\times 640$; *e*, microhair, $\times 1250$; *f*, base of macrohair, $\times 416$.

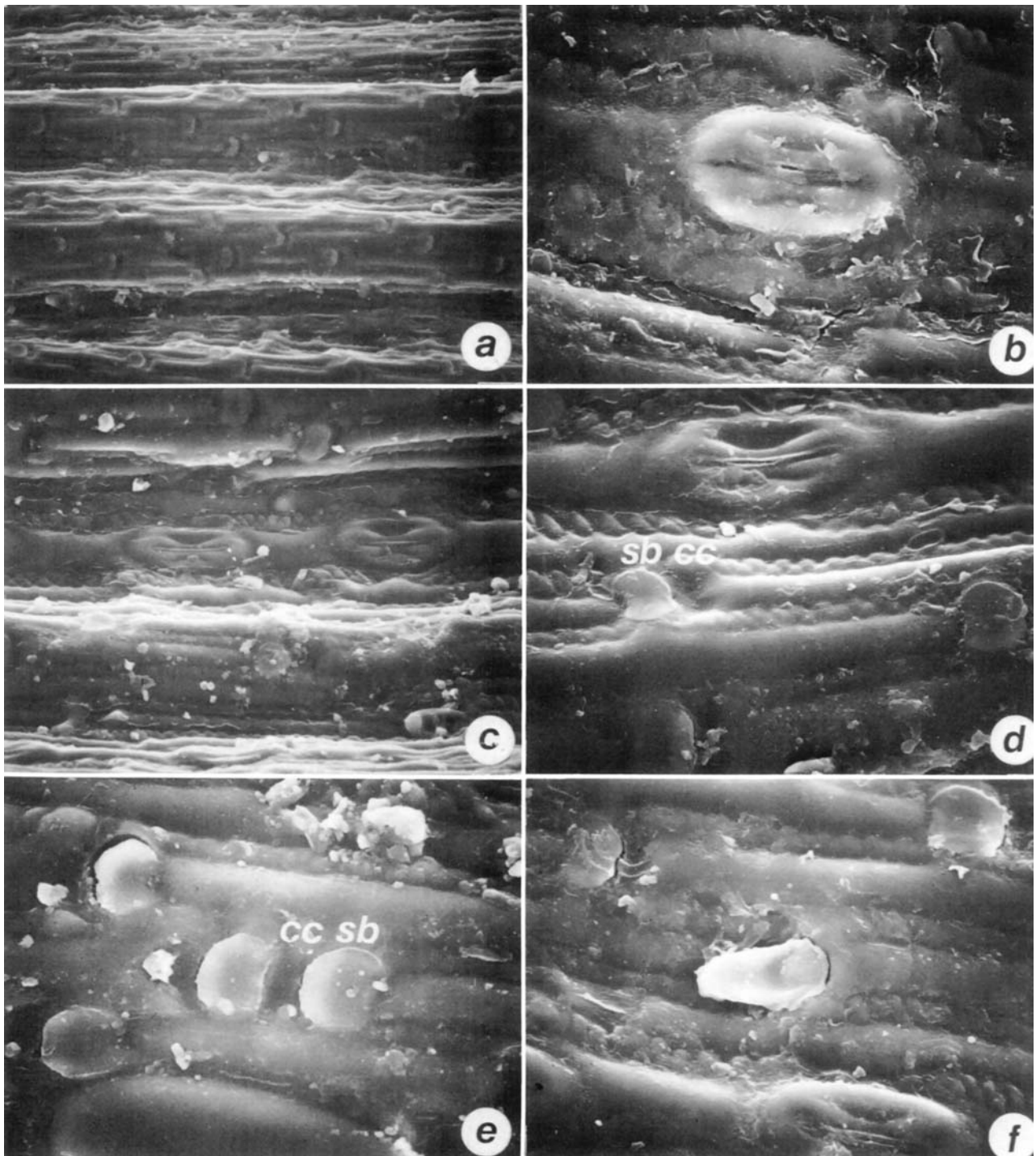


PLATE 83.—Abaxial epidermis *Sporobolus africanus*, Maas 6094: *a*, overview, $\times 295$; *b*, stoma, $\times 1285$; *c*, interstomatal cell, $\times 625$; *d*, long cells, intercostal silica bodies (sb), intercostal cork cells (cc), $\times 1285$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, microhair, $\times 1285$.

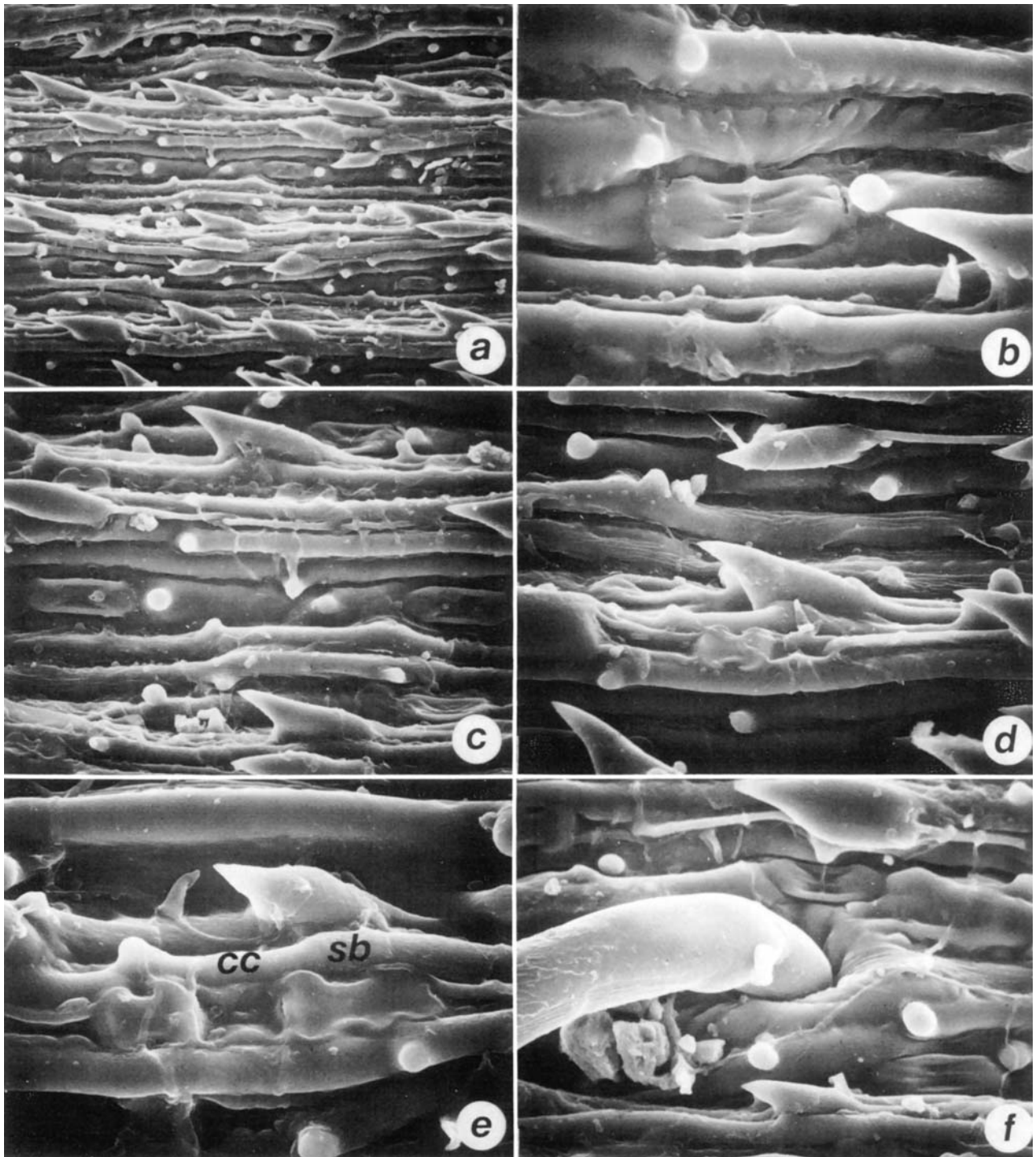


PLATE 84.—Adaxial epidermis *Sporobolus africanus*, Maas 6094: *a*, overview, $\times 295$; *b*, stoma, $\times 1285$; *c*, interstomatal cells, $\times 625$; *d*, costal prickle, long cells, $\times 867$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1285$; *f*, base of macrohair, $\times 867$.

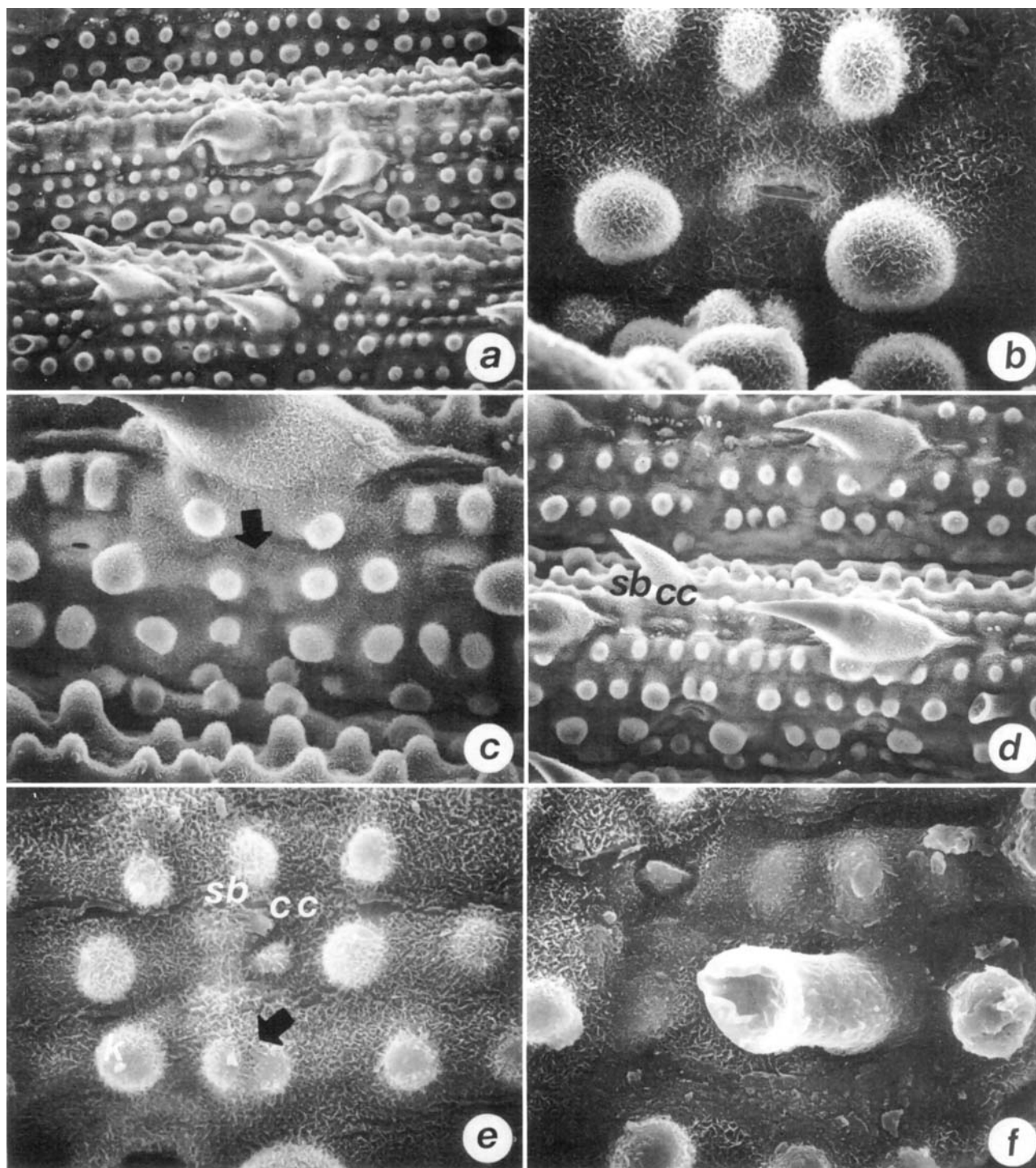


PLATE 85.—Abaxial epidermis *Lepturus repens*, Bogdan 3642: *a*, overview, $\times 295$; *b*, stoma, $\times 1696$; *c*, interstomatal cell (arrow), $\times 867$; *d*, costal prickles, silica bodies (sb), cork cells (cc), $\times 416$; *e*, intercostal silica body (sb), cork cell (cc), compound papilla (arrow), $\times 1696$; *f*, microhair, $\times 1696$.

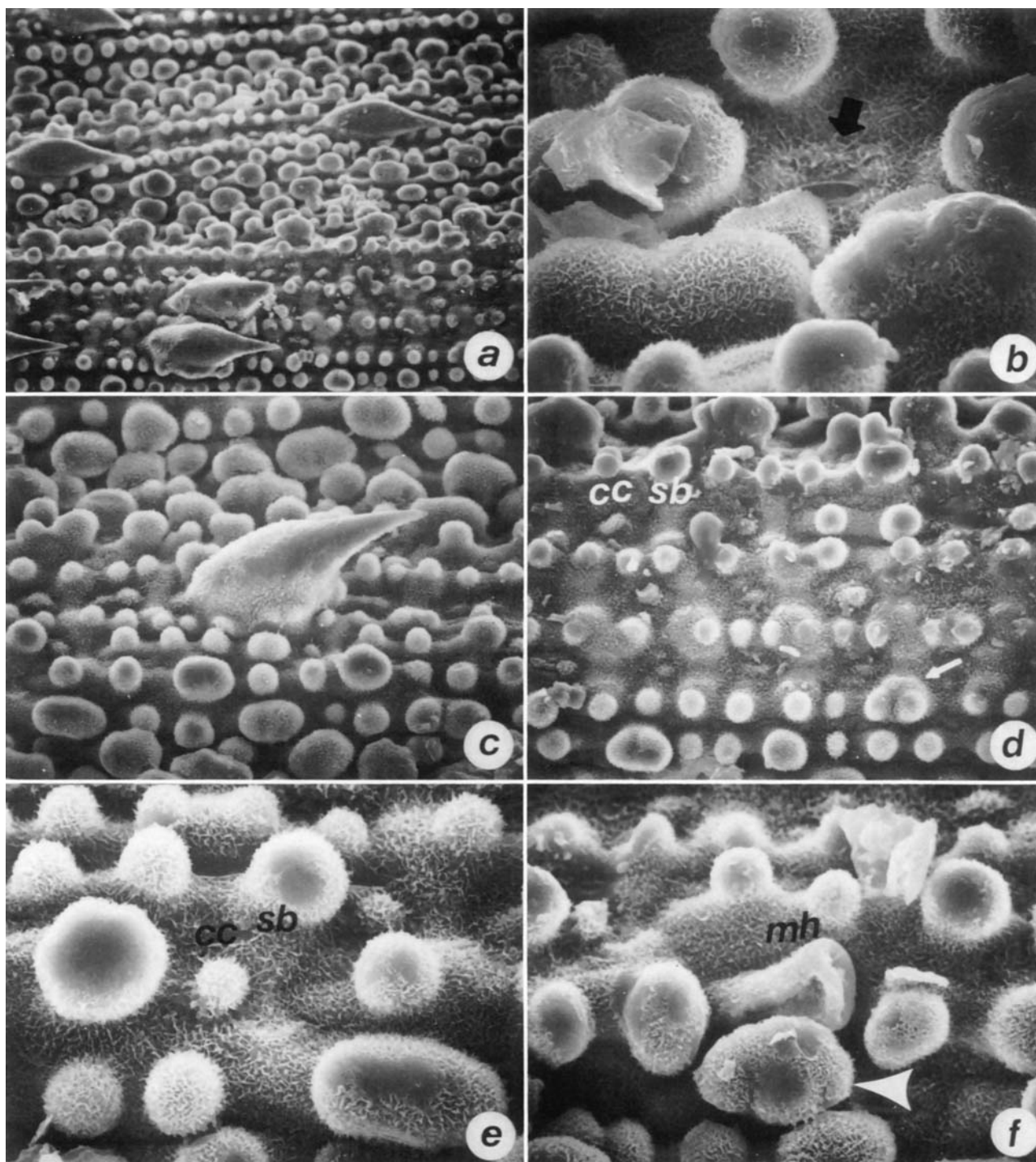


PLATE 86.—Adaxial epidermis *Lepturus repens*, Bogdan 3642: *a*, overview, $\times 295$; *b*, stoma (arrow), $\times 1696$; *c*, costal prickle, $\times 625$; *d*, costal silica bodies (sb), cork cells (cc), compound papilla (arrow), $\times 625$; *e*, intercostal silica body (sb), cork cell (cc), $\times 1696$; *f*, microhair (mh), compound papilla (arrow), $\times 1285$.

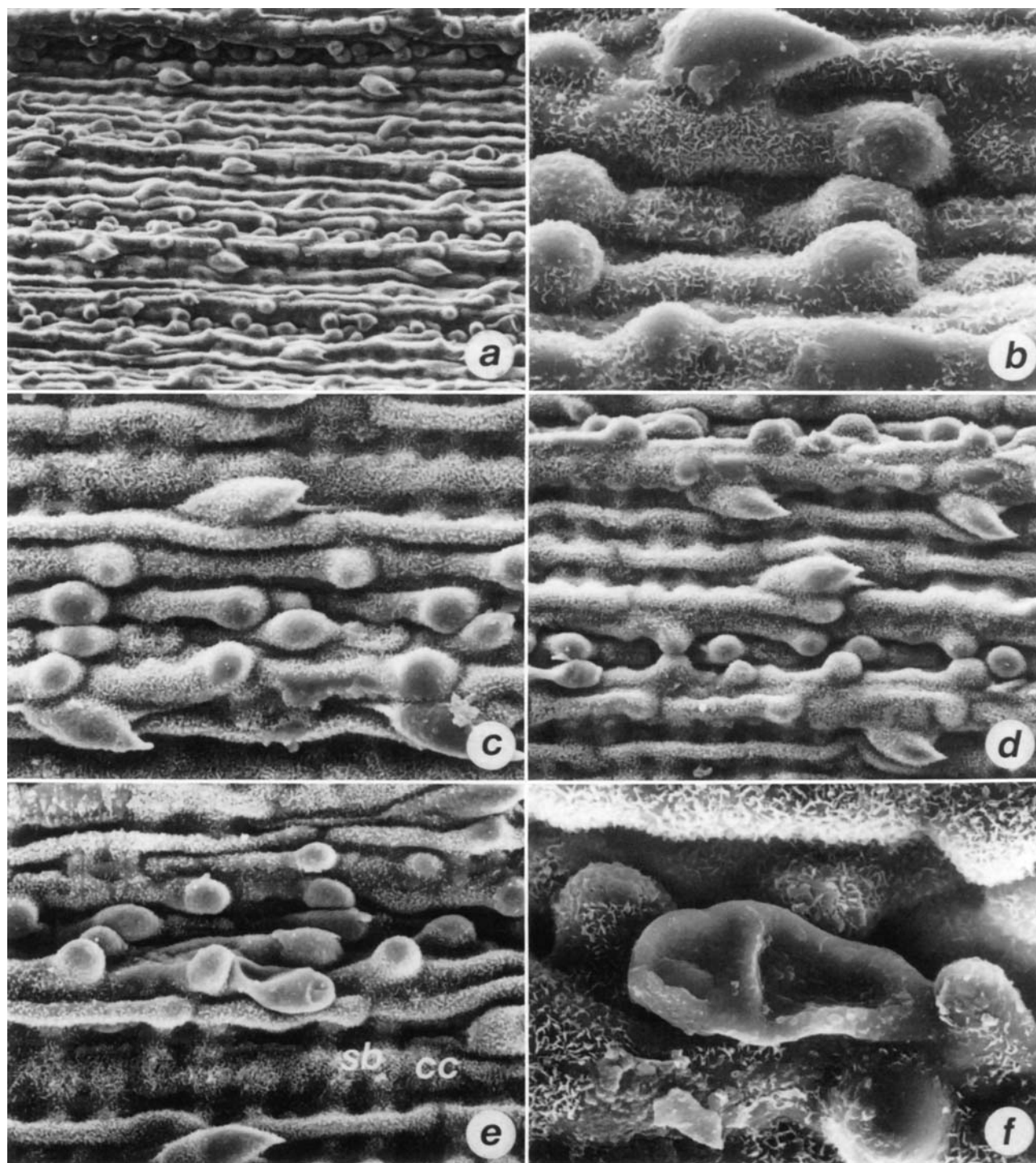


PLATE 87.—Abaxial epidermis *Dignathia gracilis*, Polhill and Paulo 650: *a*, overview, $\times 240$; *b*, stoma, $\times 1250$; *c*, interstomatal cells, long cells, $\times 640$; *d*, costal prickles, $\times 480$; *e*, costal silica bodies (sb), cork cells (cc), $\times 640$; *f*, microhair, $\times 1875$.

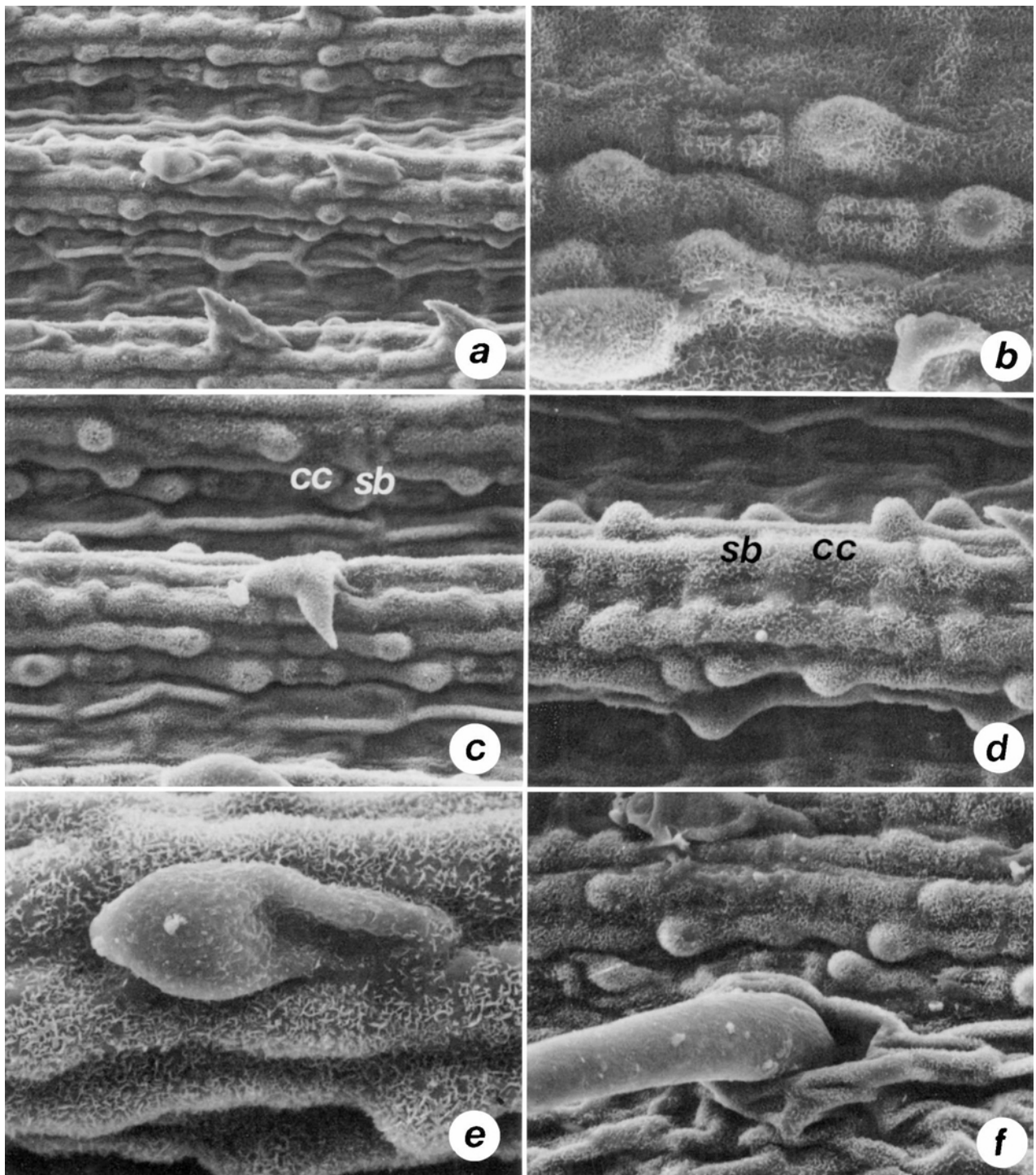


PLATE 88.—Adaxial epidermis *Dignathia gracilis*, Polhill and Paulo 650: *a*, overview, $\times 416$; *b*, stomata, interstomatal cells, $\times 1250$; *c*, interstomatal cells, long cells, intercostal silica body (sb), cork cell (cc), $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 768$; *e*, microhair, $\times 1875$; *f*, base of macrohair, $\times 768$.

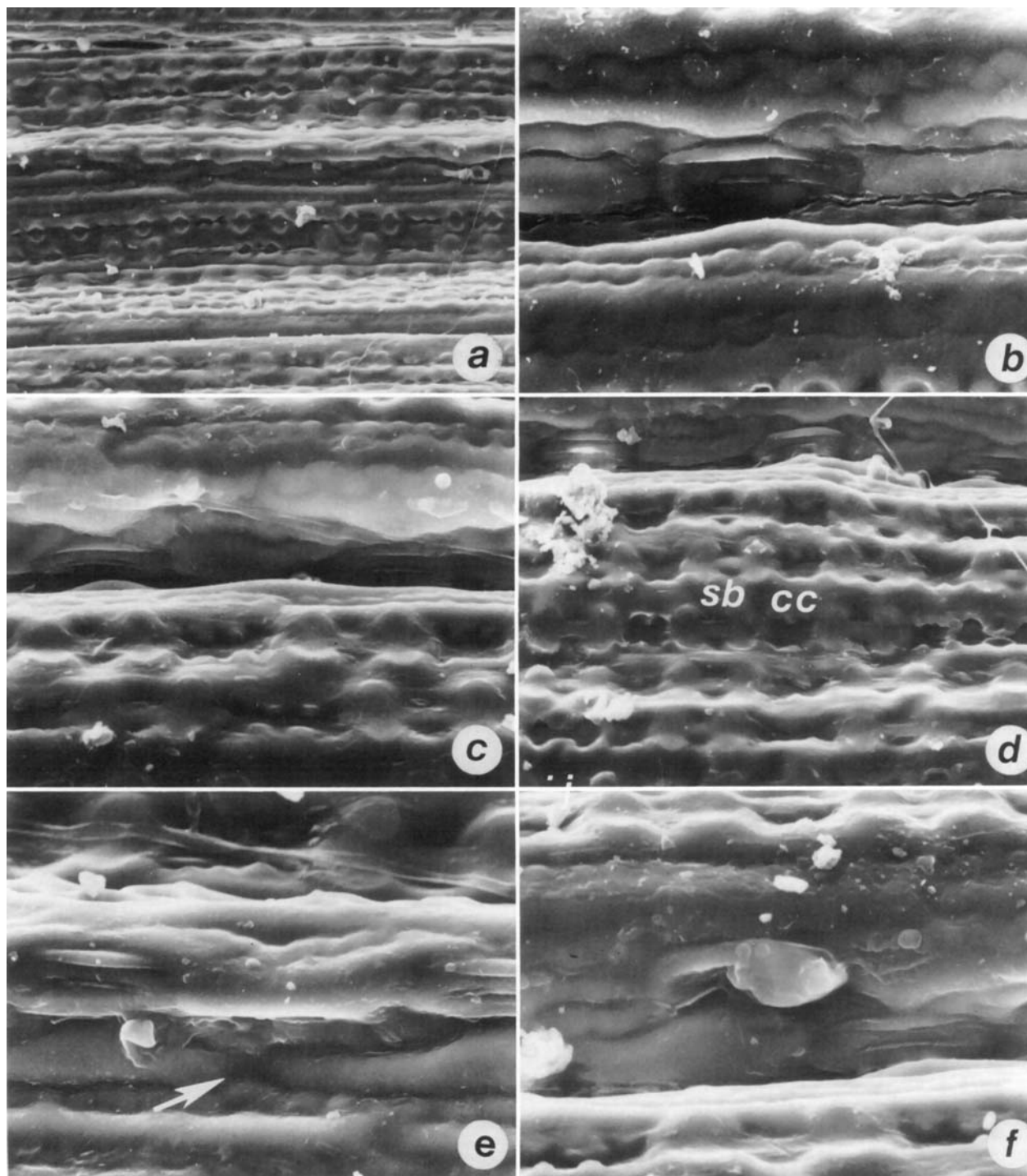


PLATE 89.—Abaxial epidermis *Farrago racemosa*, Anderson 1316: *a*, overview, $\times 352$; *b*, stoma, long cells, $\times 1375$; *c*, interstomatal cell, long cells, $\times 1250$; *d*, costal silica bodies (sb), cork cells (cc), $\times 704$; *e*, long cells, intercostal cork cell (arrow), $\times 1375$; *f*, microhair, $\times 1375$.

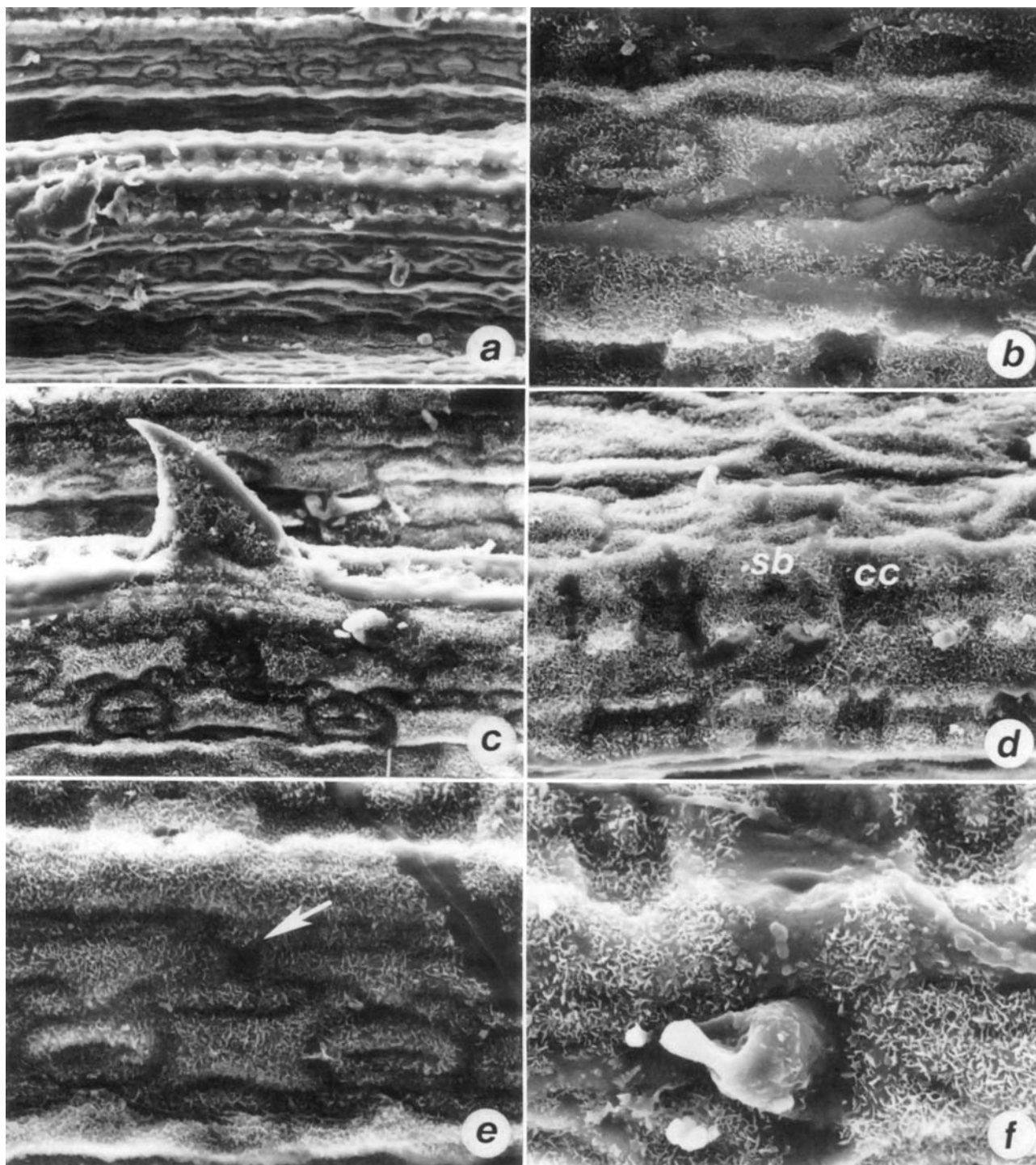


PLATE 90.—Adaxial epidermis *Farrago racemosa*, Anderson 1316: *a*, overview, $\times 320$; *b*, stomata, interstomatal cell, $\times 1285$; *c*, stomata, interstomatal cells, prickle, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 960$; *e*, interstomatal cell, long cells, intercostal cork cell (arrow), $\times 1250$; *f*, microhair, $\times 1375$.

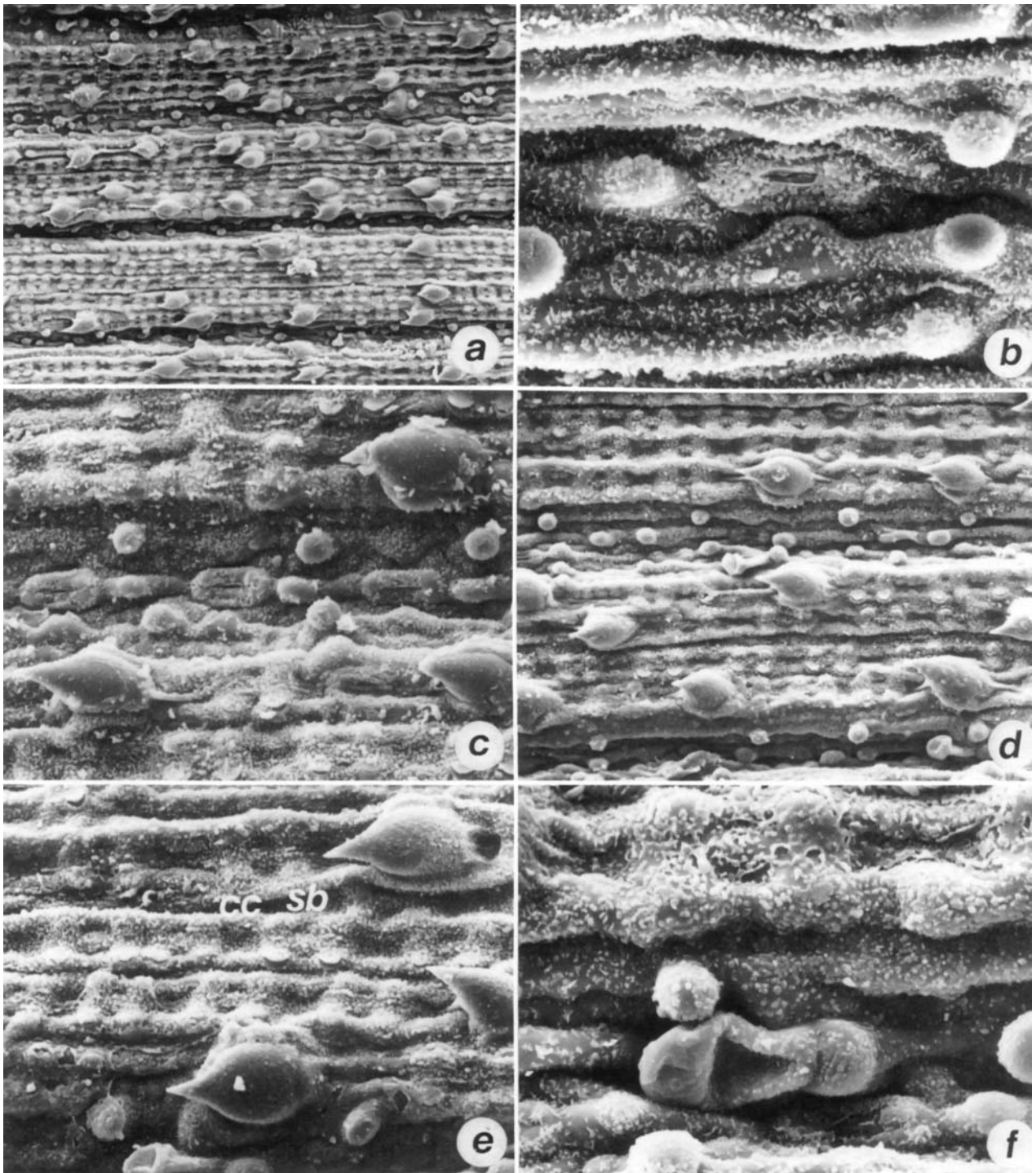


PLATE 91.—Abaxial epidermis *Leptothrium senegalensis*, Robertson 1788: *a*, overview, $\times 160$; *b*, stoma, long cells, $\times 1250$; *c*, stomata, interstomatal cells, $\times 640$; *d*, costal prickles, $\times 320$; *e*, costal silica bodies (sb), cork cells (cc), $\times 640$; *f*, microhair, $\times 1250$.

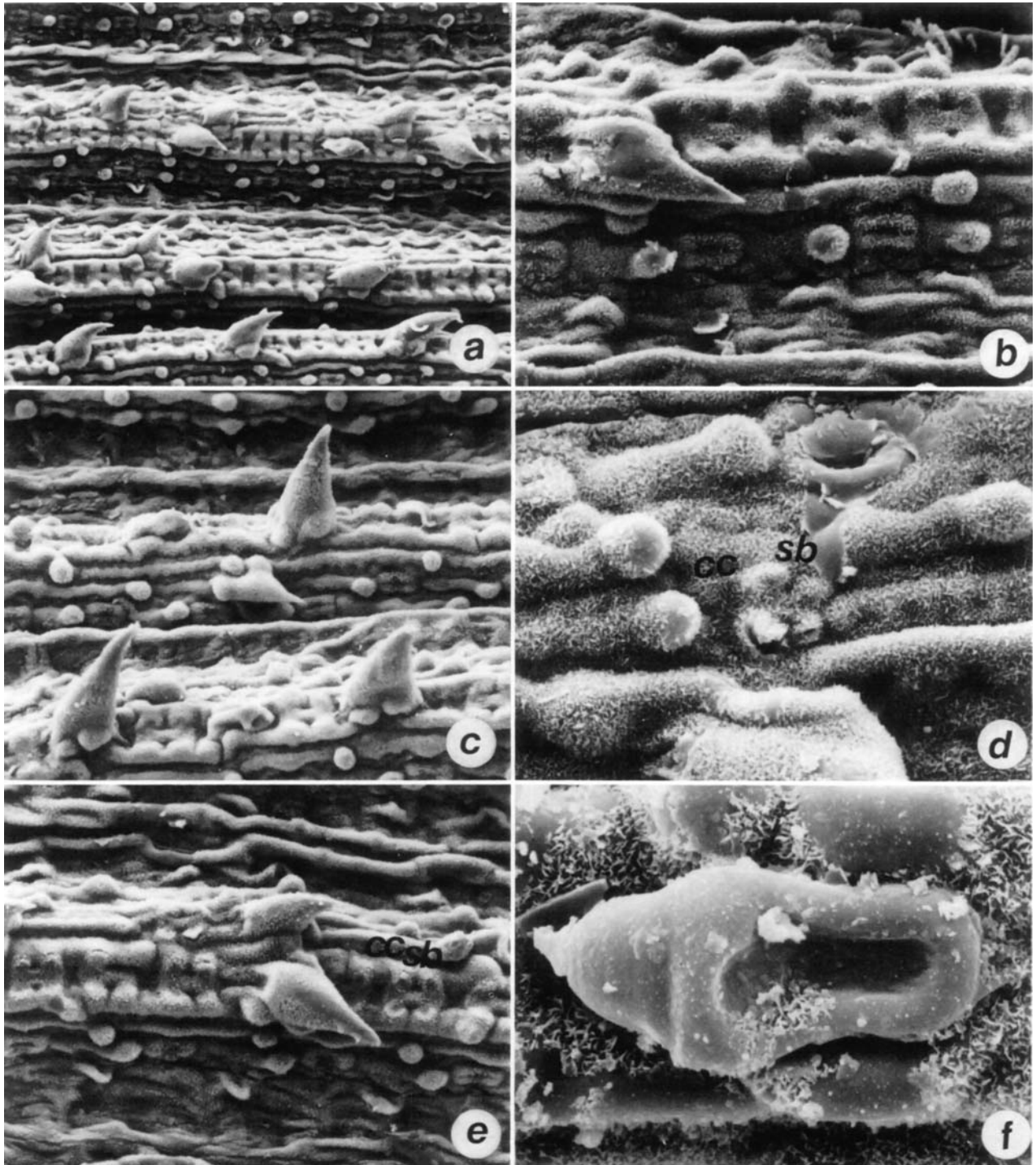


PLATE 92.—Adaxial epidermis *Leptothrium senegalensis*, Robertson 1788: *a*, overview, $\times 240$; *b*, stomata, interstomatal cells, $\times 640$; *c*, costal prickles, $\times 416$; *d*, intercostal silica body (sb), cork cell (cc), $\times 1250$; *e*, costal silica bodies (sb), cork cells (cc), $\times 480$; *f*, microhair, $\times 2500$.

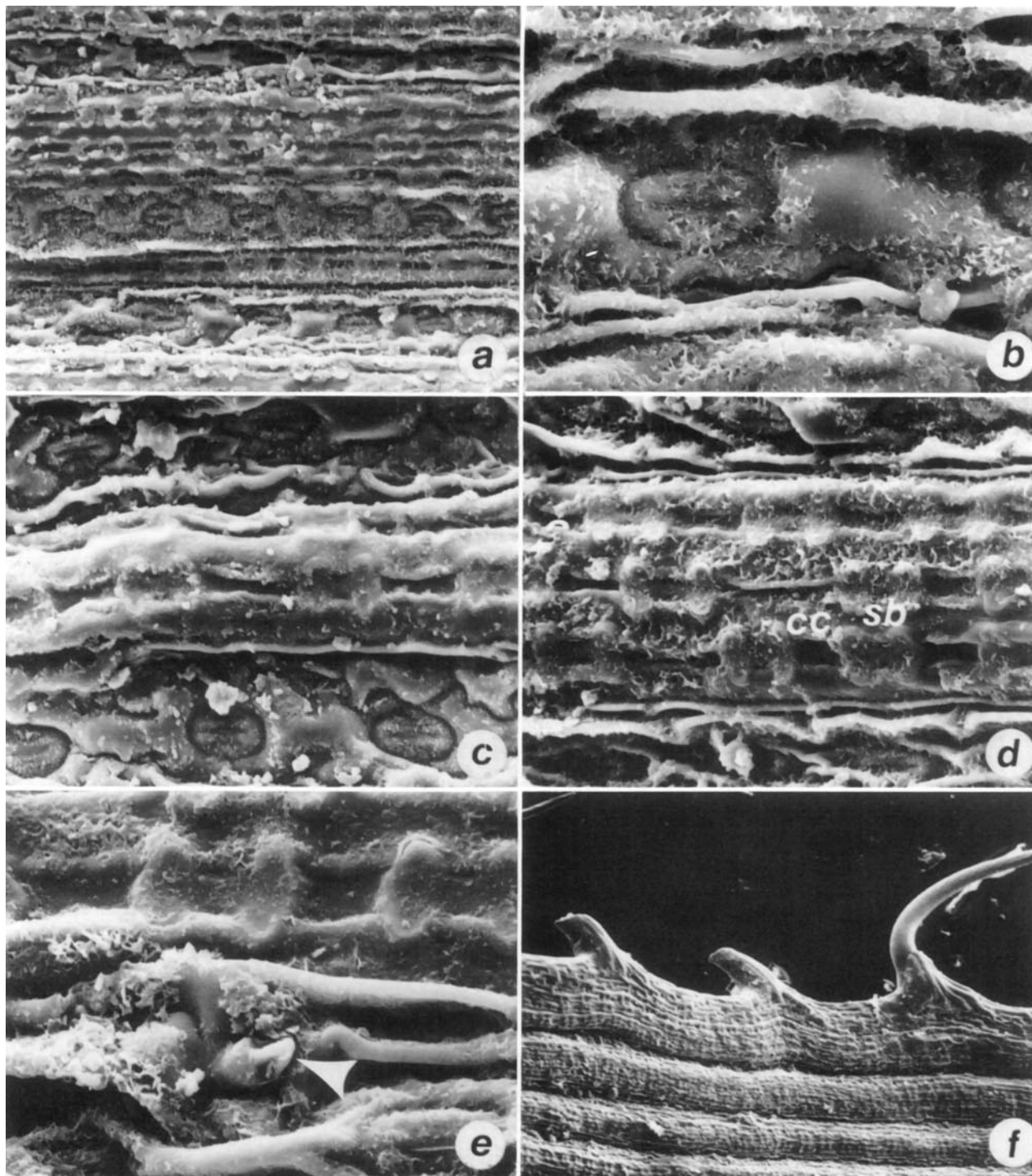


PLATE 93.—Abaxial epidermis *Perotis patens*, Crook 938: *a*, overview, $\times 320$; *b*, stoma, interstomatal cell, $\times 1250$; *c*, long cells, interstomatal cells, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, microhair (arrow), $\times 1250$; *f*, macrohairs, $\times 80$.

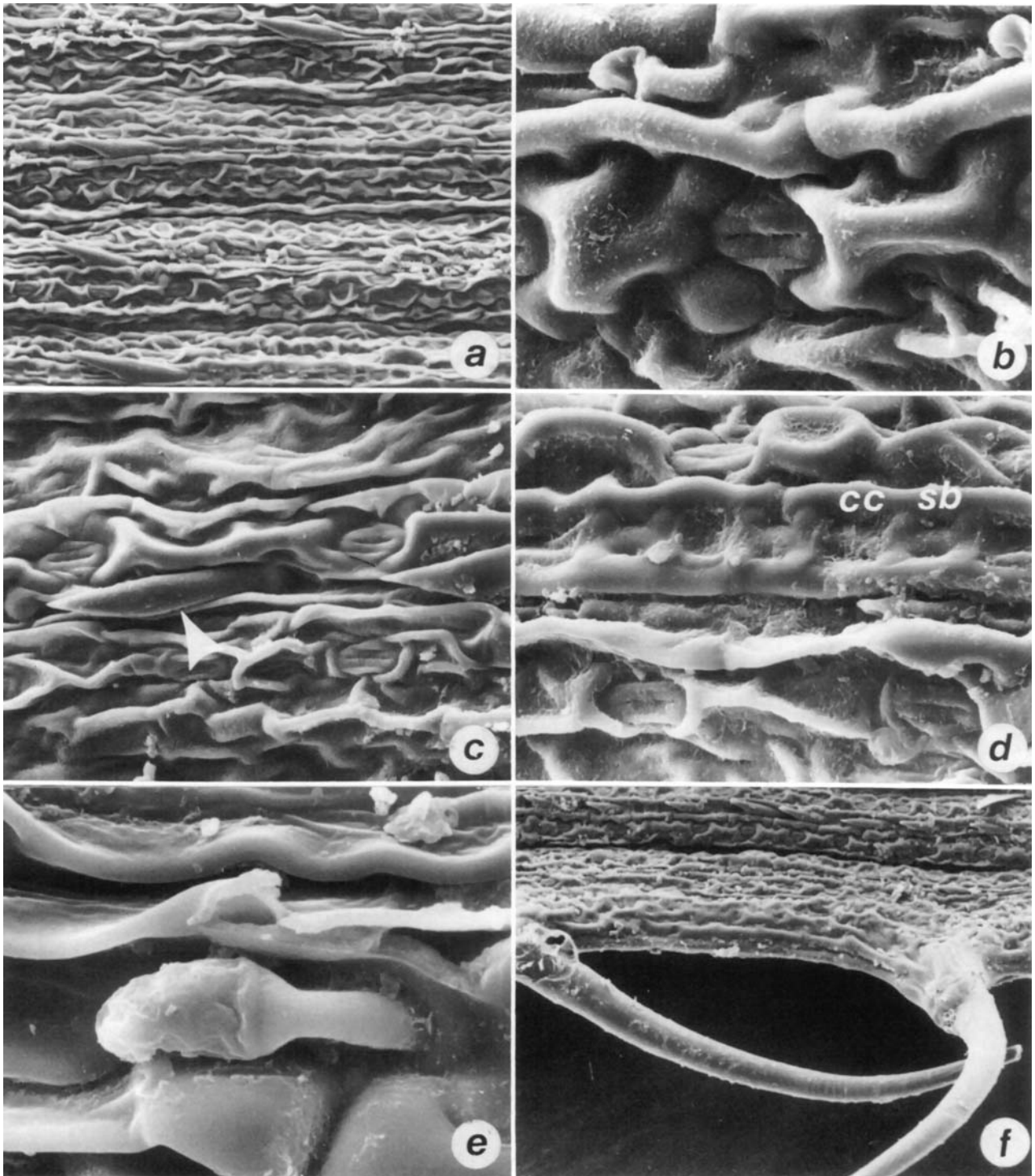


PLATE 94.—Adaxial epidermis *Perotis patens*, Crook 938: *a*, overview, $\times 240$; *b*, stoma, interstomatal cells, $\times 1250$; *c*, prickle (arrow), long cells, interstomatal cells, $\times 640$; *d*, costal silica bodies (sb), cork cells (cc), $\times 960$; *e*, microhair, $\times 2500$; *f*, macrohairs, $\times 160$.

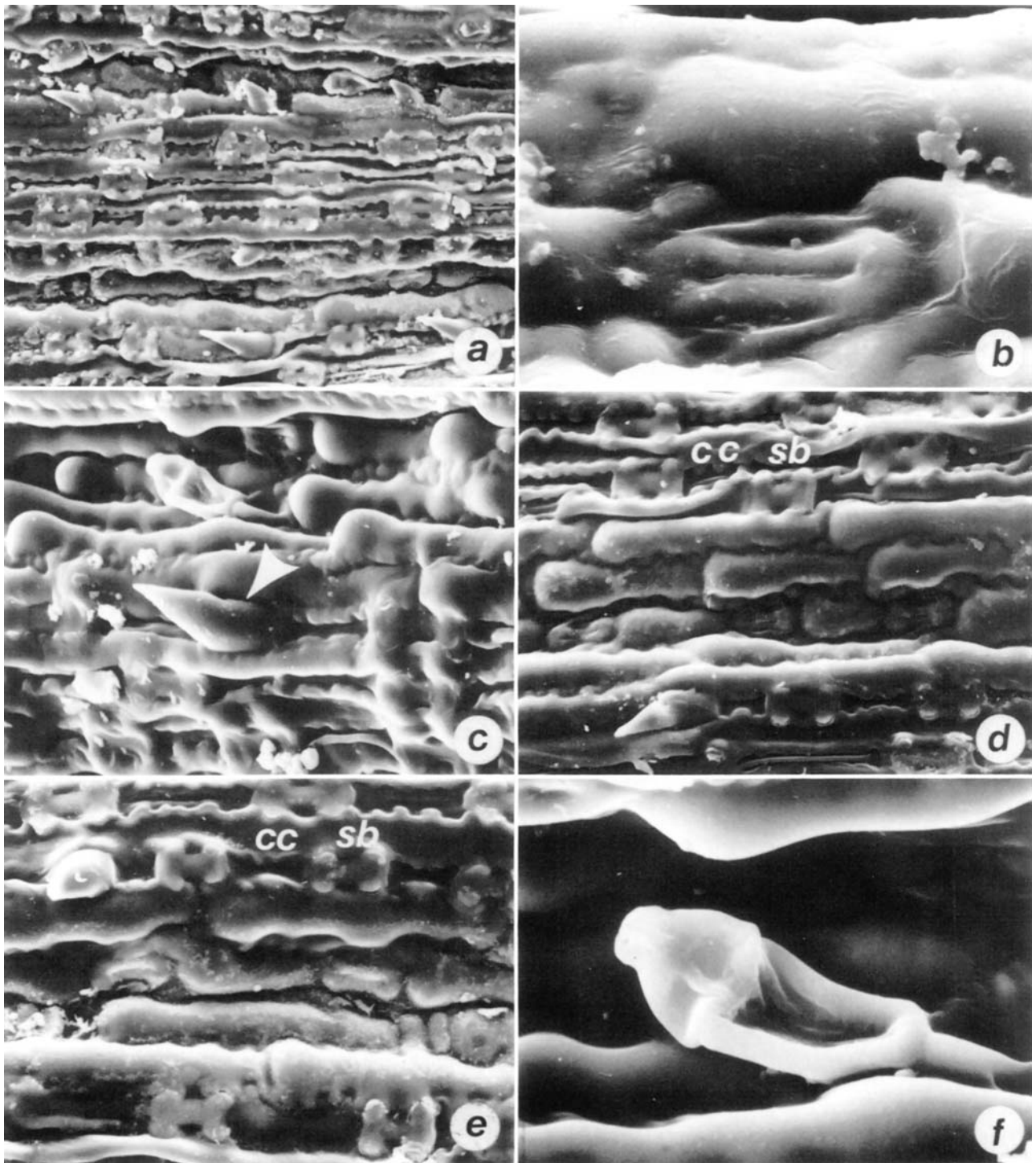


PLATE 95.—Abaxial epidermis *Tetrachaete elionuroides*, Greenway and Kanuri 12882: *a*, overview, $\times 384$; *b*, stoma, $\times 2500$; *c*, costal prickle, microhair (arrow), $\times 960$; *d*, long cells, costal silica bodies (sb), cork cells (cc), $\times 640$; *e*, intercostal silica body (sb), cork cell (cc), $\times 732$; *f*, microhair, $\times 2500$.

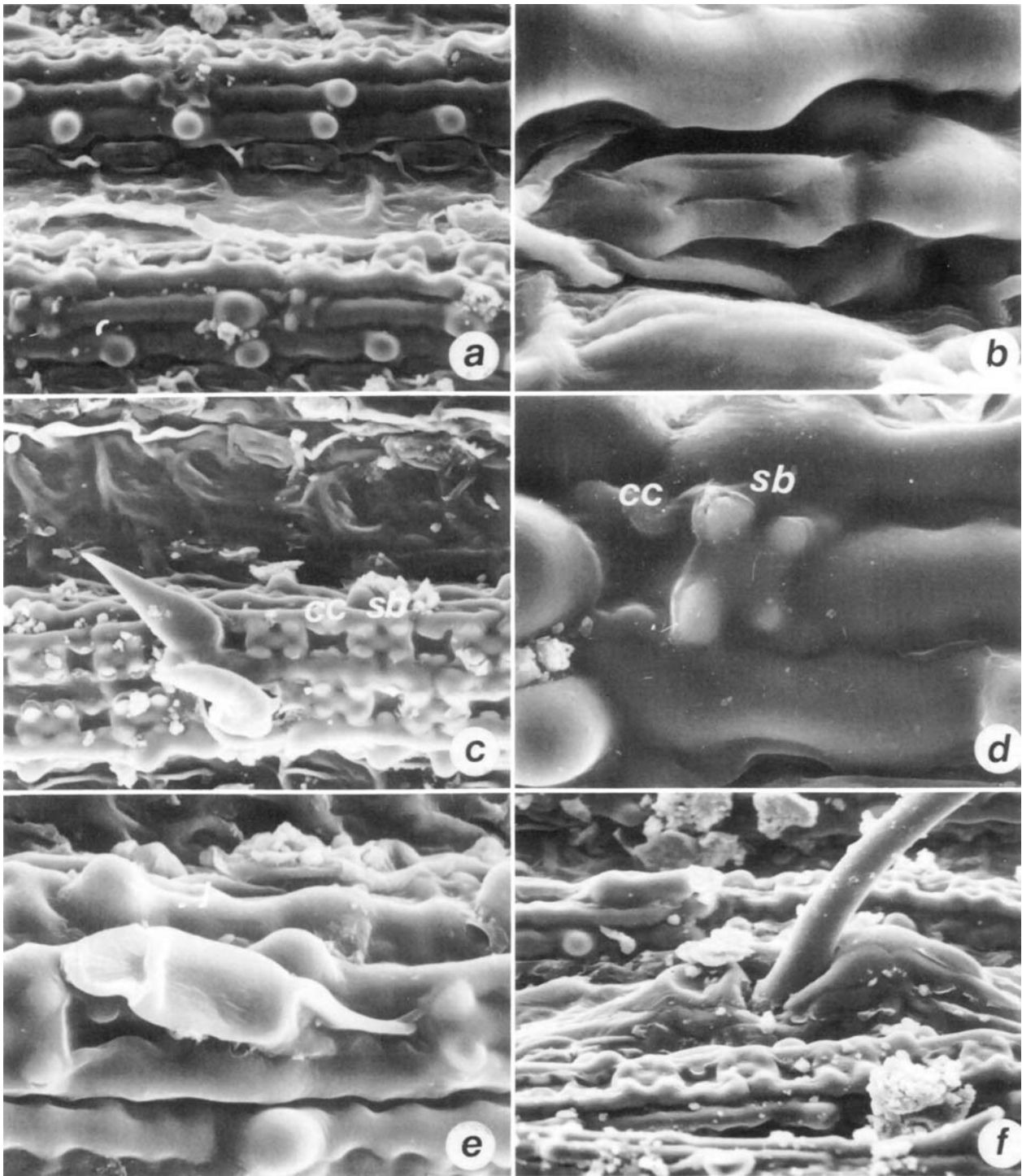


PLATE 96.—Adaxial epidermis *Tetrachaete elionuroides*, Greenway and Kanuri 12882: *a*, overview, long cells, $\times 640$; *b*, stoma, $\times 2500$; *c*, costal prickles, silica bodies (sb), cork cells (cc), $\times 640$; *d*, intercostal silica body (sb), cork cell (cc), $\times 2500$; *e*, microhair, $\times 1625$; *f*, base of macrohair, $\times 640$.

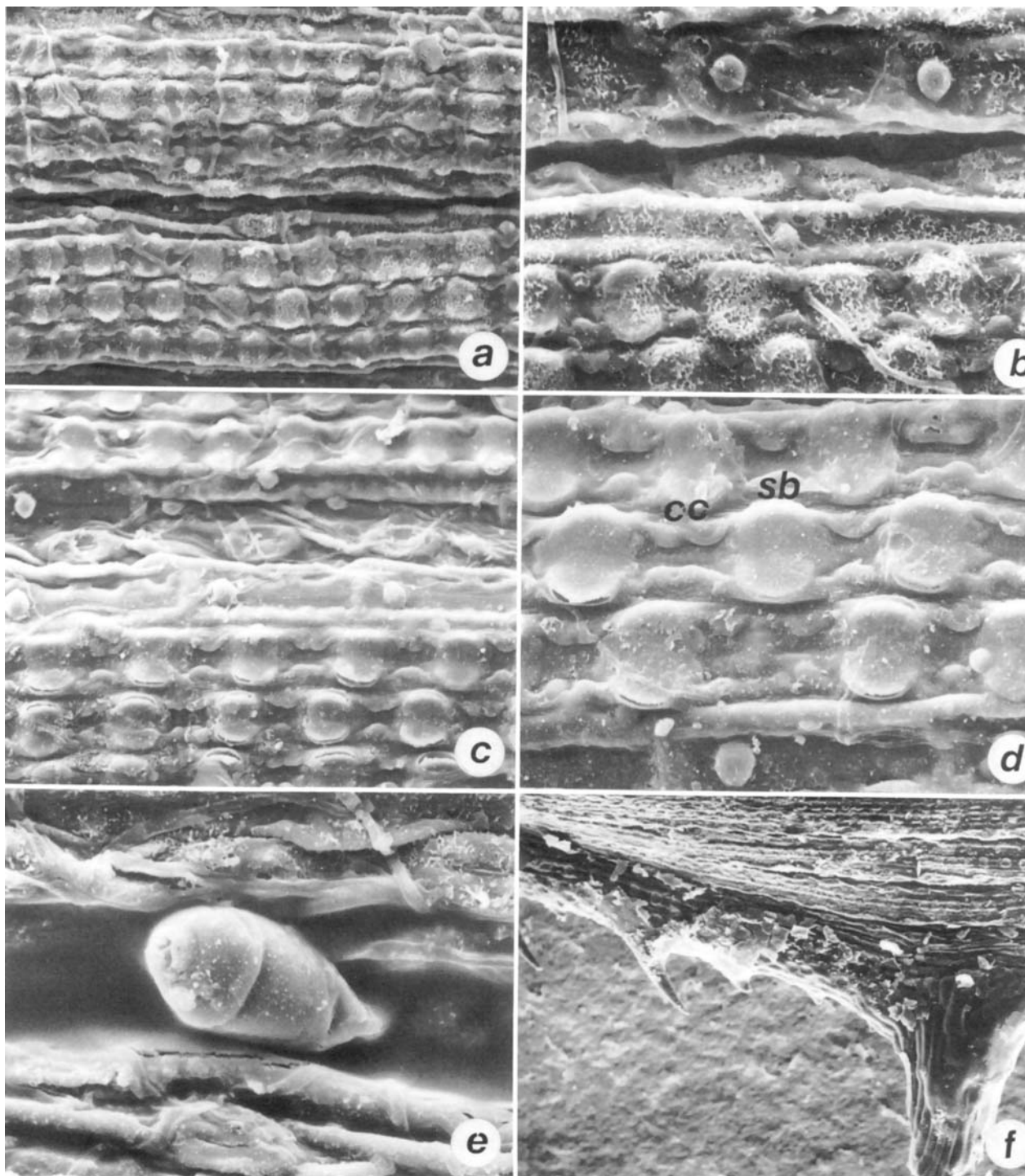


PLATE 97.—Abaxial epidermis *Tragus berteronianus*, Faulkner 3706: *a*, overview, $\times 384$; *b*, stoma, long cells, $\times 768$; *c*, interstomatal cells, long cells, $\times 576$; *d*, costal silica bodies (sb) and cork cells (cc), $\times 720$; *e*, microhair, $\times 1250$; *f*, marginal macrohair, short macrohair, $\times 120$.

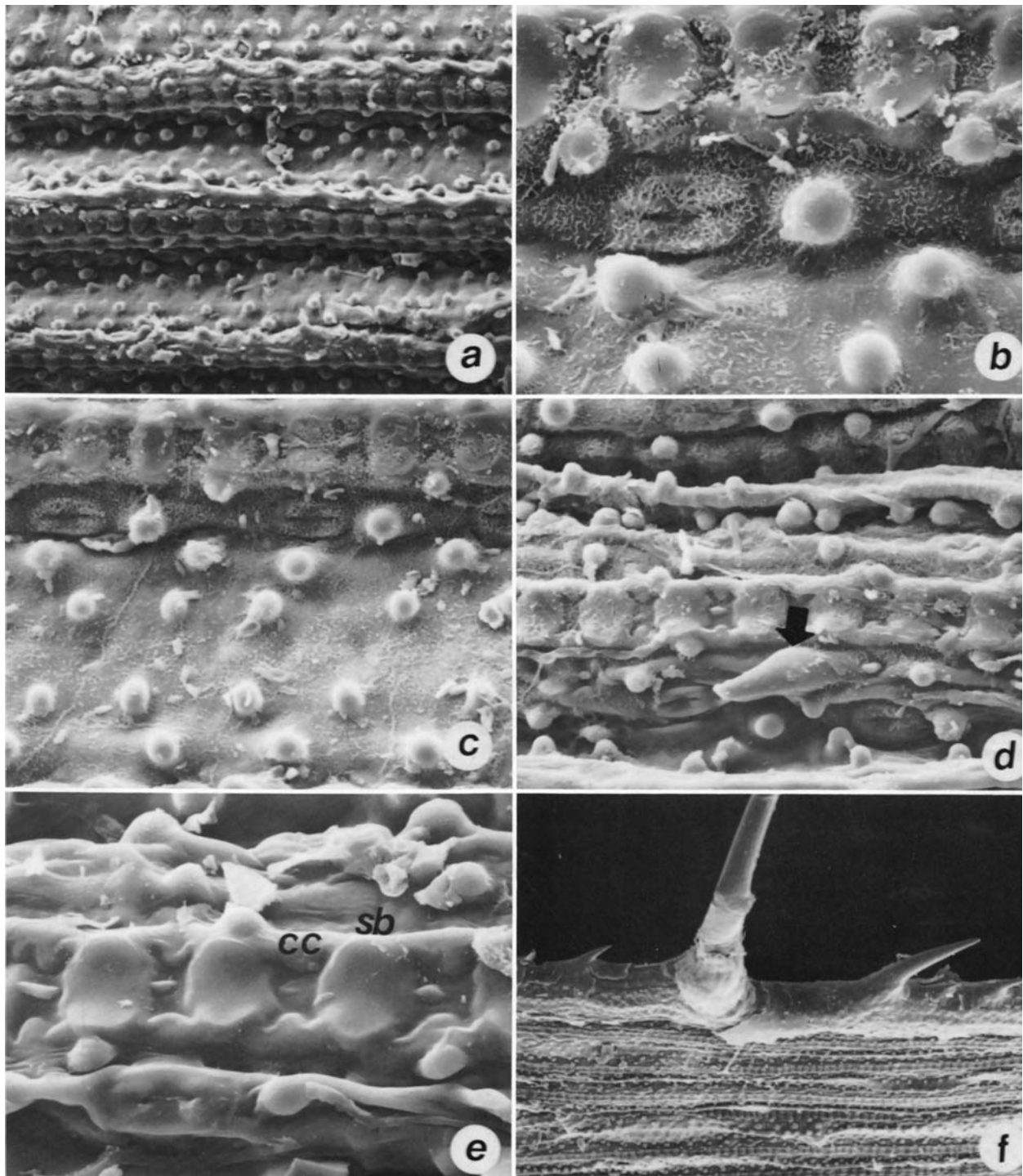


PLATE 98.—Adaxial epidermis *Tragus berteronianus*, Faulkner 3706: *a*, overview, $\times 240$; *b*, stoma, interstomatal cell, $\times 1250$; *c*, interstomatal cells, long cells, $\times 640$; *d*, prickle (arrow), $\times 640$; *e*, costal silica bodies (sb), cork cells (cc), $\times 1250$; *f*, marginal macrohair, short macrohair, prickles, $\times 80$.

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