Biosystematic Studies of Ceylonese Wasps, XV: A Monograph of the Alyssoninae, Nyssoninae, and Gorytinae (Hymenoptera: Sphecoidea: Nyssonidae)

KARL V. KROMBEIN

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ABSTRACT

Krombein, Karl V. Biosystematic Studies of Ceylonese Wasps, XV: A Monograph of the Alyssoninae, Nyssoninae, and Gorytinae (Hymenoptera: Sphecoidea: Nyssonidae). *Smithsonian Contributions to Zoology*, number 414, 43 pages, 39 figures, 1985.—Twelve species of Alyssoninae, Nyssoninae, and Gorytinae are described from Sri Lanka; six are endemic, five occur in India, and one is known from India and Burma.

The new taxa are the following: *Analysson rufescens*, new genus and species, from Sri Lanka and South India; *Alysson triangularis*, new species, from Sri Lanka; and *Ammatomus xerophilus*, new species, from Sri Lanka. The new *pictus* Group is described in *Hoplisoides*.

Nysson horni Strand is synonymized with *N. rugosus* Cameron, *Nysson basalis* Smith is transferred to *Brachystegus*. *Brachystegus dubitatus* (Turner) is a valid species and is removed from the synonymy of *B. decoratus* (Turner). The Indian *Hoplisoides capitatus* (Nurse) is a valid species and is removed from the synonymy of *H. pictus* (Smith).

Lectotypes are designated for *Nysson rugosus* Cameron and *Gorytes alipes* Bingham.

The forefemoral "carina" in certain *Ammantomus* females is discovered to be a brush of dense, flattened, agglutinated setae, and hair brushes are described at the bases of abdominal sterna V and VI in *Ammatomus* males.

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Karl V. Krombein

Introduction

The present contribution is the second in a series of three on members of the Ceylonese Nyssonidae, and treats three of its five subfamilies, the Alyssoninae, Nyssoninae, and Gorytinae. There are two genera and three species each in the Alyssoninae and Nyssoninae, and four genera and six species of Gorytinae. The first part in the series treated the Stizinae with two genera and nine species (Krombein, 1984). The last part will be a revision of the Ceylonese and South Indian Bembicinae currently in preparation by J. van der Vecht and myself; this subfamily contains only the single genus *Bembix* Latreille with six Ceylonese species. A key to the five subfamilies of Nyssonidae occurring in Sri Lanka follows the next section "Biology."

The preceding number in my series "Biosystematic Studies of Ceylonese Wasps" is "XIV: A Revision of *Carinostigmus* Tsuneki (Hymenoptera: Sphecoidea: Pemphredonidae)," *Smithsonian Contributions to Zoology*, number 396, 37 pages, 52 figures, 1984.

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Within Sri Lanka, I am indebted to Co-Principal Investigator W. Thelma T.P. Gunawardane, presently Director of the Department of National Museums, who planned itineraries and arranged accommodations for our field parties. P.B. Karunaratne, former Curator of Insects at the Museum, accompanied me on many of the field trips resulting in the collection of a majority of specimens on which this study is based.

I am indebted to the following for the loan of material: George R. Ferguson, Oregon State College (Corvallis) for the loan of insightful specimens collected in South India by P.S. Nathan; Christopher O'Toole, Hope Department of Entomology, Oxford University (Oxford), for the types of *Alysson ruficolle* Cameron, *Nysson basalis* Smith, *N. erythropoda* Cameron, *Gorytes amatorius* Smith, syntypes of *N. rugosus* Cameron, and helpful information on Smith's types; W.J. Pulawski, California Academy of Sciences, San Francisco, for the loan of several species of Palaearctic *Ammatomus*; and Colin R. Vardy, Department of Entomology, British Museum (Natural History)

(London), for the types of *Nysson dubitatus* Turner, *Gorytes greenii* Bingham, the type series of *N. decoratus* Turner, syntypes of *Gorytes alipes* Bingham, other non-type specimens, and for helpful information. The localities cited in parentheses in the foregoing list are used in the text to indicate depositories of particular specimens. The only acronym used is USNM, which denotes specimens in the National Museum of Natural History, Smithsonian Institution.

I am grateful to the following for identification of the cicadellid prey of *Alysson triangularis*, new species: W.J. Knight, British Museum (Natural History), and James P. Kramer, Systematic Entomology Laboratory (SEL), U.S. Department of Agriculture.

George L. Venable, Department of Entomology, Smithsonian Institution (SI), made the line drawings, and retouched and mounted the scanning electron micrographs. Susann G. Braden, and Heidi Wolf, Scanning Electron Microscope Laboratory (SI) took the photographs. Sandra S. Gingras, Department of Entomology (SI) provided efficient technical support in the preparation of specimens for SEM study.

I appreciate the helpful suggestions made by John M. Burns (SI) and Arnold S. Menke (SEL).

Biology

The majority of Nyssonidae are predaceous, solitary, mostly ground-nesting wasps, but members of the Nyssoninae are cleptoparasites in the nests of various genera of Gorytinae, and possibly also in those of *Bembecinus* (Stizinae). Species of *Bembix* (Bembecinae) and *Bembecinus* practice progressive provisioning, that is, the nest is not fully stored with prey before the egg hatches, but the female wasp brings in one or more prey a day after the egg hatches until enough have been provided to bring its larva to maturity. The species of *Stizus* (Stizinae) and of the various genera of Alyssoninae and Gorytinae practice mass provisioning, that is, the cell is completely stored with prey and sealed before the egg hatches.

During my field work in Sri Lanka I obtained considerable information on the biology of several species of Nyssonidae. I include below the very meager data on Alyssoninae, Nyssoninae, and Gorytinae. The substantial information on Stizinae was presented elsewhere (Krombein, 1984), while the equally voluminous data on Bembicinae are in preparation for a joint contribution on the systematics of the subfamily by J. van der Vecht and myself.

Alyssoninae

Evans (1966:29) noted that species of *Alysson* nested in "relatively cool, moist situations," that the burrow was usually vertical or nearly so, that as many as five cells might be constructed within the burrow from the bottom upward although only 1-celled nests were found in the Palaearctic species, and that the prey usually consisted of nymphal or adult Cicadellidae and less frequently Cercopidae or Fulgoroidea.

The Ceylonese *A. triangularis*, new species, occurs most commonly in shaded, damp situations in the Wet Zone. I obtained two prey records for this species in Udawattakele Sanctuary, Kandy. I caught one female wasp (21275 C) at 1455 on 12 February on a leaf holding its paralyzed prey, an adult female leafhopper (Cicadellidae), *Idioscopus clypealis* (Lethierry), 3 mm long. The plant was near a nearly vertical bank of kudu gala, a soft sandstone. I captured a second female (6778 B) hovering in front of another bank, carrying a paralyzed female prey of the same leafhopper, 3.5 mm long. This species of *Alysson* apparently nests in the sloping or nearly vertical kudu gala banks in Udawattakele, for we collected other specimens without prey crawling upon the bank or alighting on foliage nearby.

Another Ceylonese alyssonine, *Analysson rufescens*, new genus and species, occurs mostly at localities in the Dry Zone. However, it appears only after rainy periods. We collected a number of times at Angunakolapelessa and Palatupana in the very xeric parts of the southeastern quadrant of Sri Lanka, but we captured *A. rufescens* at each locality only once, each time after a rainy period.

NYSSONINAE

So far as known the species of Nyssoninae are cleptoparasites in the nests in soil of other sphecoid wasps (Evans, 1966:85 et seq.). The female nyssonine searches out, presumably by odor cues, burrows of host wasps that store several prey per cell, or enters a nest after observing the host wasp entering or leaving. If provisioning has begun, the nyssonine lays an egg in a concealed location, such as beneath the wings of a prey, and does not destroy the host egg. The nyssonine larva hatches before the host wasp larva, searches out and destroys the host egg, and then feeds on the stored prey.

The few positive host records of *Nysson* in the United States and Europe are of species of several genera of Gorytinae. There is, however, some circumstantial evidence that the European stizine, *Bembecinus tridens* (Fabricius), may occasionally serve as host of *Nysson dimidiatus* Jurine rather than the usual gorytine hosts of that particular nyssonine.

I believe it is almost certain that the normal hosts of the Ceylonese *Nysson rugosus* Cameron are species of *Bembecinus*, particularly the very common and ubiquitous *B. pusillus* (Handlirsch) and *B. proximus* (Handlirsch) (Krombein, 1984:11). Species of Gorytinae are extremely rare or uncommon in Sri Lanka as will be noted from the locality records cited herein for the six Ceylonese species. *Nysson rugosus* is exceptionally common at a number of localities in the Dry Zone, and has been captured on the same dates as several species of *Bembecinus* at Trincomalee, Ekgal Aru Sanctuary, and Angunakolapelessa.

The European *Brachystegus scalaris* (Illiger) has been found in nests of the larrid wasp, *Tachytes europaeus* Kohl. The *Brachystegus* egg was found in one cell on the grasshopper prey of the host wasp, but the host egg was not found. The two Ceylonese species of *Brachystegus* are very rare and I have no surmises as to possible hosts. If Larridae are the preferred hosts of *Brachystegus*, there are many species of a number of genera in Sri Lanka, including the abundant, widespread *Tachytes modestus* Smith.

GORYTINAE

Argogorytes caerulescens (Turner) is a rare species known so far only from two localities in the Wet Zone where the average annual rainfall is 1950 and 3900 mm. My single female was collected visiting flowers of a creeper in the Sinharaja rain forest. Callan (1980) summarized the information available on the biology of four Palaearctic taxa and one from New Zealand. These species excavated uni- or multicellular nests in the ground and preyed upon nymphal Aphrophoridae except for one that preyed upon adult Issidae. The taxa discussed by Callan belong to the typical section of the genus, the females of which have a flattened triangular pygidium of the type that is possessed by ground-nesting wasps. *Argogorytes caerulescens* and several other taxa belong to an atypical section of the genus in which the female pygidium is quite narrow and almost parallel-sided. These two differently formed pygidia (Figures 13, 14) are similar to those found in the crabronid genus *Lestica*. Females of typical *Lestica* have a broad triangular pygidium and are known to nest in the ground, whereas those of the subgenus *Solenius* have the pygidium strongly narrowed on the apical section and are known to nest in sound or rotten wood. I suspect that *A. caerulescens* has a nesting habit similar to that of *Solenius*, and that it undoubtedly preys upon Homoptera.

Very little is known of the biology of *Lestiphorus*. Bernard (1934:249) reported that the European *L. bicinctus* (Rossi) preyed upon Cercopidae (spittle insects), specifically *Philaenus spumarius* Linnaeus. Nothing is known of the nesting habits, but the presence in the female of a fore tarsal comb and a flattened triangular pygidium suggests that the Ceylonese *A. greenii* (Bingham) probably nests in the soil. Bingham (1896) stated that at the time of its capture the type "was carrying off a Homopterous insect with which to store her nest."

Hook (1981:409, 410, fig. 2b) described the nest of the Australian *Ammatomus icarioides* (Turner) as being usually multicellular and in open sandy-clay areas in Eucalyptus forest, fre-

quently beneath leaf litter. The prey consisted of five species of Flatidae and one of Eurybrachidae. It is presumed that the three Ceylonese species will have similar nesting habits and may prey upon a variety of Homoptera.

Evans (1966:33–57, figs. 28–37) presented new data on the biology of several North American *Hoplisoides* and summarized previously published information on a number of species from North and South America, Europe, and Thailand. A majority of the species preyed upon nymphal and adult treehoppers (Membracidae); others preyed upon leafhoppers (Cicadellidae) and Tettigometridae. Each species of wasp preyed upon members of a single family of Homoptera, except for *H. punctatus manjikuli* Tsuneki, which included one adult chalcidoid (Encyrtidae) among a dozen nymphs of Membracidae. Most species nest in open sandy areas, sometimes beneath leaf litter, and construct from one to three cells per nest. No biological information is available for the single species occurring in Sri Lanka, *H. pictus* (Smith), but two of the three females that we captured were taken on sand along stream banks. Presumably its nest and prey will conform to the pattern found in extralimital species.

Family NYSSONIDAE

Key to the Subfamilies of Nyssonidae

(Excluding subfamilies Mellininae and Heliocausinae, not found in Sri Lanka)

1. Labrum longer than broad, exserted; ocelli deformed, scar-like, anterior ocellus transverse, posterior ocelli crescentic; midtibia with one apical spur; second submarginal cell not petiolate ..... *BEMBICINAE

   Labrum broader than long, exserted or not; ocelli normal, rounded; midtibia with two apical spurs except in Alyssoninae; second submarginal cell petiolate (Alyssoninae, Nyssoninae, some Stizinae) or not . 2

2. Midtibia with one apical spur; pronotum anteriorly not abruptly declivous, collar twice as broad as an ocellus; second submarginal cell petiolate; dorsal surface of propodeum longer than declivous posterior surface ..... ALYSSONINAE

   Midtibia with two apical spurs; pronotum abruptly declivous anteriorly, collar narrow, not wider than an ocellus; second submarginal cell petiolate or not; dorsal surface of propodeum shorter, no longer than declivous posterior surface 3

3. Scutum anteriorly with a short median carina; abdominal sternum I with a pair of strong carinae near midline, diverging slightly posteriorly; second submarginal cell petiolate ..... NYSSONINAE

   Scutum anteriorly with a short median furrow or a pair of close, shallow, delicate grooves (admedian lines); abdominal sternum I either with a median carina that may bifurcate toward apex, or not at all carinate; second submarginal cell petiolate only in *Bembecinus luteolus* Krombein 4

* The subfamily Bembicinae includes only the genus *Bembix* Fabricius with six species in Sri Lanka.

4. Forewing stigma separated from basal vein by four or more times length of stigma; first submarginal cell elongate, 1.5 or more times combined length of second and third submarginal cells; triangular propodeal enclosure extending over dorsal and onto posterior surface almost to apex of latter ..... **STIZINAE

Forewing stigma separated from basal vein by less than length of stigma; first submarginal cell short, no longer than second and third submarginal cells combined; triangular propodeal enclosure usually confined to dorsal surface, never extending far onto posterior surface ..... GORYTINAE

Key to the Species of Alyssoninae, Nyssoninae, and Gorytinae

1. Second submarginal cell petiolate 2
   Second submarginal cell not petiolate 7
2. Midtibia with one apical spur; pronotum anteriorly not abruptly declivous, collar twice as broad as an ocellus; dorsal surface of propodeum longer than declivous posterior surface [Figures 3–5]. ALYSSONINAE 3

   Midtibia with two apical spurs; pronotum abruptly declivous anteriorly, collar narrow, not wider than an ocellus; dorsal surface of propodeum shorter than posterior declivous surface. NYSSONINAE 5
3. Propodeal dorsum not strongly, transversely carinate apically, posterolateral tooth weak, enclosure extending over basal three-fifths, its apex rounded [Figure 4]; pronotum not crenulate posteriorly; labrum trilobate apically and female clypeus truncate apically [Figure 16]; female mesopleuron dull from small punctures separated by less than diameter of a puncture; female thorax without pale markings, scutellum, metanotum, metapleuron, and propodeum red; male forewing fasciate ..... 1. ***Analysson rufescens,*** new genus and species

   Propodeal dorsum with a strong transverse carina apically terminating in a well-developed lateral tooth, enclosure extending over entire length of dorsum, its apex angulate [Figures 3, 5]; pronotum crenulate posteriorly; labrum truncate apically, and female clypeus tridentate apically (unknown in *A. ruficollis*) [Figure 15]; female mesopleuron glossy, with minute punctures separated by several times diameter of a puncture; female thorax black except a pair of creamy marks on pronotal dorsum and scutellum, or anterior part of thorax red and pale spots absent; male forewing not fasciate 4
4. Propodeum with areolets on either side of transverse dorsal carina smaller, more numerous [Figure 5]; female thorax black except a pair of creamy spots on pronotum and scutellum; female

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** The subfamily Stizinae in Sri Lanka includes two species of *Stizus* Latreille and seven species of *Bembecinus* Costa (Krombein, 1984).

forewing with an infumated spot in part of marginal and submarginal cells ..... 3. ***Alysson triangularis,*** new species

Propodeum with areolets on either side of transverse dorsal carina larger, less numerous [Figure 3]; female thorax lacking creamy spots, pronotum except anteriorly in middle, scutum, scutellum, metanotum, and upper half of meso- and metapleura red; female forewing without an infumated spot ..... 2. ***Alysson ruficollis*** Cameron

5. Posterior ocelli without a ridge or tubercle along anterolateral margin; hind tibia not serrate above; propodeal dorsum adjacent to enclosure with sparser, subappressed silvery setae, not tomentose; clypeal margin not bidentate medially; posterior margin of pronotum and scutellum anteriorly white to creamy; male abdominal sterna II–V without an apical fringe of long curled setae, tergum VI without posterolateral tooth ..... 4. ***Nysson rugosus*** Cameron

   Posterior ocelli with a low oblique ridge along anterolateral margin; hind tibia serrate above; propodeal dorsum adjacent to enclosure with dense silvery tomentum; clypeal margin medially with a pair of strong, narrowly separated teeth; integument of thorax dark; male abdominal sterna II–V with apical fringe of long curled setae on median third or half, tergum VI with strong posterolateral tooth. *Brachystegus* Costa 6

6. Front below and laterad of ocellar triangle mostly subcontiguously pitted, both the pits and interspaces between them with dense minute punctures [Figure 9]; male tergum VII bidentate apically; legs except coxae light red as is abdominal tergum I except for posterolateral pale spot; terga I–V with large, posterolateral, bright yellow spots decreasing in size beyond II; declivous anterior surface of tergum I with thin, rather unnoticeable silvery tomentum .... 5. ***Brachystegus dubitatus*** (Turner)

   Front below and laterad of ocellar triangle mostly contiguously pitted, dense minute punctures present only in pits [Figure 8]; male tergum VII tridentate apically; legs dark except fore- and midfemora and tibiae occasionally dark red beneath in part; terga I–IV in female, I–V in male, with large posterolateral white to creamy or pale yellow spots, decreasing in size beyond II; declivous surface of tergum I with dense silvery tomentum ..... 6. ***Brachystegus basalis*** (Smith)

7. Inner eye margins diverging strongly above, interocular distance at posterior ocelli 2.5 or more times that at base of clypeus; antenna strongly clavate, flagellar segments broadening noticeably toward apex; mesopleuron anteriorly not ridged or grooved; abdomen petiolate. *Ammatomus* Costa 8

   Inner eye margins not diverging strongly above, interocular distance at posterior ocelli 0.9–1.3 times that at base of clypeus; antenna not clavate, flagellar segments very slightly, if at all, broadened toward apex; mesopleuron anteriorly with a vertical ridge, margined behind by a groove; abdomen not petiolate except in *Lestiphorus* 12

8. Females; antenna 12-segmented, abdomen 6-segmented 9
   Males; antenna 13-segmented, abdomen 7-segmented 11
9. Pale markings lemon yellow, legs predominantly black and yellow, red, if present, restricted to ventral aspect of mid- and hind femora and foretibia; scutum with scattered larger punctures, those anteriorly usually separated by half or more the diameter of a puncture and becoming sparser posteriorly [Figure 11]; largest mesopleural punctures slightly larger than on scutum, mostly separated by half or more the diameter of a puncture; posterior margin of forefemur with a dense brush of short flattened setae [Figures 34–36] that cause it to appear sharply edged; lateral carina of first tergum extending almost to posterior margin; 8.3–10.0 mm long . . . . . 9. ***Ammatomus alipes*** (Bingham)
   Pale markings white or creamy, legs predominantly light red with some white and a few black markings; scutal punctures larger, mostly subcontiguous anterolaterally [Figure 12]; larger punctures of mesopleuron subcontiguous to separated by about half the diameter of a puncture; forefemur with or without such a brush of setae; 6.5–8.6 mm long 10
10. Apical third of propodeal enclosure glossy with a few scattered minute punctures; anterior ocellus surrounded by coarse contiguous punctures; posterior margin of forefemur sharply edged; first abdominal segment 1.0–1.2 times as long as wide, tergum with lateral carina extending almost to posterior margin . . . . . 10. ***Ammatomus amatorius*** (Smith)
    Apical third of propodeal enclosure not glossy, with many minute punctures and a few larger ones on anterior half; anterior ocellus surrounded by smaller punctures ranging from subcontiguous to separated by about half the diameter of a puncture; posterior margin of forefemur rounded; first abdominal segment 1.6 times as long as wide, tergum with lateral carina not extending beyond spiracle . . . . . 11. ***Ammatomus xerophilus,*** new species
11. Flagellar segments III–VIII with a low rounded tubercle beneath in middle; area round anterior ocellus with smaller punctures separated by at least half the diameter of a puncture; larger punctures of scutum small, separated by at least the diameter of a puncture [Figure 11]; propodeal enclosure rather dull from dense minute punctation and with a few scattered small punctures; first transverse cubital vein with a short stub near lower end extending into first submarginal cell; sixth abdominal sternum with dense fine punctures; legs black and yellow . . . . . 9. ***Ammatomus alipes*** (Bingham)
    Flagellar sements not tuberculate beneath; area around anterior ocellus with coarse contiguous punctures; larger punctures of scutum coarse, contiguous to subcontiguous anterolaterally [Figure 12]; propodeal enclosure glossy except anterolaterally dull and densely micropunctate, glossy area with scattered minute punctures and a few larger

punctures; first transverse cubital vein without a stub; sixth abdominal sternum with larger contiguous punctures; legs light red, black and creamy ..... 10. ***Ammatomus amatorius*** (Smith)

12. Dorsal surface of propodeum short, median enclosed triangular area broader, extending on posterior declivous surface halfway to apex; apical margins of abdominal terga II–IV narrowly reflexed and lamellate [Figure 10]; female pygidium narrow, with parallel sides, lateral groove with only a few setae [Figure 14]; integument metallic blue without pale markings, antenna and legs black, wings uniformly dark brown; female foretarsus without a rake of long bristles along posterior margin; male unknown .... 7. ***Argogorytes caerulescens*** (Turner)

Dorsal surface of propodeum longer, median triangular area not extending onto declivous posterior surface; apical margins of abdominal terga not reflexed; female pygidium broad, triangular, sides converging toward apex, surface with dense appressed or subappressed setae [cf. Figure 13]; integument including appendages predominantly black and red with yellow markings, forewing mostly clear but with a dark brown spot covering most of marginal, and second and third submarginal cells; female foretarsus with a rake of long bristles along posterior margin 13

13. Abdomen petiolate, first segment much narrower at apex than base of second segment; scutellum, metanotum, and mesopleuron coarsely carinate; propodeum reticulate except triangular enclosure longitudinally ridged; yellow bands present on posterior margins of pronotum and abdominal terga II–IV, and on scutellum and metanotum; 14 mm long; male unknown ..... 8. ***Lestiphorus greenii*** (Bingham)

Abdomen not petiolate, sides of first segment diverging gradually to apex, which is not narrower than base of second segment; scutellum, metanotum, and mesopleuron punctate; propodeum also punctate except basal triangular enclosure partly or entirely longitudinally ridged; male with tooth at juncture of hypostomal and occipital carinae [Figures 17, 18), tooth lacking in female and occipital carina not quite reaching hypostomal carina; male hind tarsal segments II–IV enlarged, each with a very long seta at inner apical angle [Figure 20]; male flagellum with some of segments concave beneath or otherwise modified [Figure 31]; yellow bands present on posterior margins of pronotum, and on abdominal terga I–IV, scutellum and sometimes metanotum; 7–9 mm long .... 12. ***Hoplisoides pictus*** (Smith)

Subfamily ALYSSONINAE

Three genera are now known, *Analysson*, new genus, confined to the Indian subcontinent; *Alysson* Panzer of the Oriental, Ethiopian, and Holarctic regions; and *Didineis* Wesmael principally from the Holarctic. I have seen material of an unidentified species of *Didineis* from South India, so this taxon may be found eventually in Sri Lanka.

Analysson, new genus

This monotypic Oriental genus is more closely related to *Alysson* of the Oriental, Ethiopian, and Holarctic regions than it is to *Didineis* of the Oriental and Holarctic regions. Characters that it shares with *Alysson* that distinguish both genera from *Didineis* are that the basal vein of the forewing arises beyond the transverse median rather than before it, the metapleuron is half as long as high rather than much less than half as long, the presence of only one midtibial spur, the second abdominal tergum with a pair of pale spots rather than being immaculate, and the penultimate segment of the male antenna without a slender projection beneath at the apex that opposes the emarginate ventral margin of the last segment. Its similarities to *Didineis* include the more massive last segment of the male flagellum, the lack of a basal volsellar lobe suggesting a cuspis (cf. Figures 1, 2), and abdominal terga III–V (VI also in male) with vestiture on the entire exposed area rather than being bare on the apical half. *Analysson* is distinct from both *Alysson* and *Didineis* in having the margin of the median lobe of the labrum strongly trilobate rather than weakly biemarginate or truncate (Figures 15, 16), in having the clypeal margin straight in the middle rather than tridentate, in having the second through tenth flagellar segments of the male with a row of stout setae beneath, in lacking a frontal groove, in the lack of an apical transverse groove on the pronotal collar, the absence of a scrobal sulcus on the mesopleuron, the lack of a transverse carina at the apex of the dorsal propodeal surface, and the presence of longer, denser coarser setae ventrally on the inner half of the male paramere (Figures 1, 2).

TYPE-SPECIES.—*Analysson rufescens*, new species.

ETYMOLOGY.—The generic name is masculine and is formed from the Greek *an* (not) plus the generic name *Alysson*.

DIAGNOSIS.—Median lobe of labrum trilobate (Figure 16); clypeus broad, apically thin, median lobe truncate; mandible with small preapical denticle and in female with an obtuse angle on inner edge near middle; male flagellar segments II–X with a row of long stout setae beneath (Figures 24, 25), intermediate segments about 1.5 times as long as wide, last flagellar segment (Figure 26) massive, emarginate beneath but not opposed by a slender projection from penultimate segment; front simple without median groove; forewing with three submarginal cells, the second petiolate, basal vein arising beyond transverse median vein; forewing of both sexes with an infumated fascia from marginal cell to lower margin; arolium of female foretarsus enlarged, tarsal comb weak, present only on basitarsus; midtibia with one apical spur; hind femur with spoon-like lobe at apex on outer side; pronotum without an apical transverse groove; scutellum with an anterior foveate groove on middle third; mesopleuron without scrobal sulcus; metapleuron half as long as high; propodeum with enclosure half as long as dorsal surface, the latter rounding gradually into posterior surface and not separated from it by a strong transverse carina, posterolateral tooth weak; abdomen relatively slender, exposed parts of terga III–V (VI also in male) with relatively dense setae; female pygidial plate triangular, flat, margined laterally on posterior half, densely setose; male sternum VII exposed, well sclerotized; male sternum VIII deeply emarginate, sides extending as a pair of slender spines; male genitalia (Figure 2), paramere with long, dense, coarse setae beneath on apical half, volsella without a subbasal lobe representing the cuspis.

1. *Analysson rufescens*, new species

FIGURES 2, 14, 16, 24–26

This nyssonid is readily distinguished in the Ceylonese fauna by a combination of the petiolate second submarginal cell, the single midtibial spur, the red color of the female thorax posteriorly, the trilobate median lobe of the labrum (Figure 16), the truncate apical margin of the clypeus, and the characteristic sculpture of the dorsal and posterior propodeal surfaces (Figure 4).

The species is widely distributed in Sri Lanka, primarily in the sandy areas of the more xeric parts, although it has been taken once on coarse sand along the bank of a river on the southwestern slope of the Adams Peak foothills. All specimens were taken at altitudes ranging from near sea level to about 150 m. The average annual rainfall ranged from 860–1075 mm in localities in the Dry Zone to some 3900 mm at Gilimale in the Wet Zone. The species occurs also in South India where it is known from two localities, one on the coast, the other inland at an altitude of 3100 ft.

ETYMOLOGY.—The species name is from the Latin *rufesco* (to become reddish).

HOLOTYPE.—♀; Sri Lanka, Uva Province, Monaragala District, Angunakolapelessa, 100 m, 21–23 Jan 1979, in Malaise trap, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardane (USNM).

FEMALE.—Length 7.0 mm. Black, the following light red: scutellum, metanotum, narrow posterior stripe on mesopleuron, metapleuron, propodeum, hind coxa and trochanter, extreme base of hind femur, apical segment of fore tarsus, and first abdominal segment except apical third of tergum; the following white: basal half of mandible, labrum, clypeus except narrowly at base, elongate subtriangular mark along inner eye margin from clypeus halfway to anterior ocellus, scape except narrowly along outer surface, pedicel above, narrow streak above on basal half of first flagellar segment, most of venter of fore- and midcoxae, foretrochanter beneath, basal half of forefemur beneath, narrow stripe on anterior surface of foretibia, stripe on basal two thirds of outer surface of midtibia, basal third of hind tibia, and transverse lateral oval spot near base of second tergum. Wings clear except forewing with infumated fascia extending across marginal cell, second and third submarginal cells, and outer half of third discoidal cell to posterior margin of wing; stigma black, veins dark brown. Vestiture: short, silvery, subappressed, moderately dense on side of clypeus, front, vertex, temples, pronotum, scutum, and mesopleuron; basal half of mandible and middle of clypeus with some long, suberect silvery setae; red areas of thorax with cinereous, subappressed, moderately dense, short setae; sides of abdominal terga I–II with scattered, long, suberect pale setae, terga III–V with suberect cinereous setae, longer and sparser on apical half, denser and shorter on basal half of exposed area; pygidium with dense, relatively short, erect brown setae on basal half, apical third with dense, appressed, reddish golden vestiture. Wings clear with a subapical infumation extending across marginal and outer two submarginal cells, broadening and weakening toward posterior margin; stigma and veins dark brown.

Clypeus and labrum (Figure 16); eyes diverging moderately above, interocular distance at anterior ocellus 1.2 times that at base of clypeus; front with close punctures separated by much less than half the diameter of a puncture; most punctures on vertex separated by about the diameter of a puncture; ocelli in a low triangle, postocellar distance 0.7 times ocellocular and ocelloccipital distances.

Pronotal disk and scutum with subconfluent punctures slightly larger than those on head; side of pronotum closely punctate except on lower third, with weak oblique rugulae above, becoming stronger on lower third; mesopleuron with close fine punctures behind omaulus, a few short longitudinal rugulae behind omaulus; metapleuron with close small punctures on upper third and scattered micropunctures on lower two-thirds; dorsal and posterior propodeal surfaces (Figure 4), rugae weaker than in most *Alysson*, enclosure short, without a pair of central, slightly divergent carinae as in *Alysson*, rugae longitudinal behind enclosure, oblique on either side of it, posterior surface with median carina and weak, mostly transverse rugulae.

ALLOTYPE.—♂; same label data as holotype but not in Malaise trap (USNM).

MALE.—Length 5.3 mm. Black, the following white: basal half of mandible, labrum, broad stripe on side of front extending from clypeus halfway to anterior ocellus, scape beneath, fore-

and midcoxae beneath, small spot at apex of hind coxa beneath, streak on basal half of forefemur, streak on outer surface of foretibia, similar streaks on basal half of mid- and hind tibiae, and round anterolateral spot on second tergum; the following light red: most of hind coxa, trochanters, most of forefemur, mid- and hind femora, and tibiae beneath. Wings and vestiture much as in holotype.

Clypeus and labrum as in female (Figure 16); interocular distance at anterior ocellus 1.3 times that at base of clypeus; front more delicately punctate than in female, most punctures separated by about the diameter of a puncture; vertexal punctures smaller and more separated; postocellar distance 0.7 times ocellocular distance and 0.8 times ocelloccipital distance; flagellar segments II–X with a row of long setae beneath (Figures 24, 25), terminal segment larger than in *Alysson*, emarginate beneath (cf. Figures 23, 26).

Punctures on pronotal disk and scutum less dense than in female, ranging from subconfluent to separated by about half the diameter of a puncture; rugulae present only on lower third of side of pronotum, lacking on mesopleuron; propodeal sculpture similar to that of female.

Pygidial area delimited by a lateral carina on apical third of seventh tergum; genitalia of paratype (Figure 2).

PARATYPES (USNM except as noted).—7♀, 3♂, same data as holotype, 6♀, 2♂ in Malaise trap. NORTHERN PROVINCE, *Mannar District*: 4♀, 3♂, Silavathurai, Kondachchi, 22–28, 23–27, 24 and 25 Jan 1978, 2♀ in Malaise trap, P.B. Karunaratne, T. Wijesinhe, M. Jayaweera, G. Ratnavira (USNM, Colombo). 3♀, 0.5 mi (0.8 km) NE Kokmotte Bungalow, Wilpattu National Park, 15, 16 Feb 1979, 2♀ in Malaise trap, K.V. Krombein, T. Wijesinhe, S. Siriwardane, T. Gunawardane. NORTH CENTRAL PROVINCE, *Anuradhapura District*: 1♀, Wildlife Society Bungalow, Hunuwilagama, nr Wilpattu National Park, 200 ft (60 m), 10–19 Mar 1970, Davis & Rowe. SABARAGAMUWA PROVINCE, *Ratnapura District*: 1♀, Gilimale, Induruwa Jungle, 5–7 Feb 1977, K.V. Krombein, P. Fernando, D.W. Balasooriya, V. Gunawardane. SOUTHERN PROVINCE, *Hambantota District*: 1♀, 1♂, Palatupana Tank, 15–50 ft (5–15 m) 18–20 Jan 1979, in Malaise trap, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardane. SOUTH INDIA: 1♀, 1♂, Coimbatore, Dec 1951 (♂) and Aug 1953 (♀), P.S. Nathan (Corvallis); 1♀, Ammatti, S(outh) Coorg, 3100 ft (945 m), Nov 1952, P.S. Nathan (Corvallis). A pair of paratypes from Sri Lanka has been deposited in the Colombo Museum, California Academy of Sciences, and in the British Museum (Natural History).

Female paratypes are 6.8–7.6 mm long, and males are 4.8–6.1 mm. There is very little variation in color or punctation.

Genus *Alysson* Panzer

Two species of *Alysson* are endemic in Sri Lanka, the very rare *A. ruficollis* Cameron, and the rather common *A. triangularis*, new species.

2. *Alysson ruficollis* Cameron

FIGURE 3

Alyson [sic!] *ruficolle* Cameron, 1898:25, 26 ["♂"=♀; Kandy, Ceylon; type in Hope Entomological Collections, Oxford University].

Alysson ruficollis Cameron.—Bohart and Menke, 1976:458 [listed].

Cameron described *A. ruficollis* from a supposed male collected in Kandy by Yerbury. The type is a headless female in the Rothney Collection, Hope Entomological Collections, Oxford University. The only label it bears is in Cameron's handwriting, "Alyson/ruficolle/Cam. Type/Ceylon." Except for the missing head it agrees well with the original description in all but a few minor details. Sexual dimorphism is readily apparent in *Alysson*, so I suspect that Cameron miswrote "♂" in the description when he meant female.

The female of *A. ruficollis* is quite distinct in the Ceylonese fauna in having red markings on the anterior part of the thorax as follows: pro-

notum except anteriorly in the middle, scutum, scutellum, metanotum, and upper half of meso- and metapleura. The female of *Analysson rufescens*, new genus and species, also has the thorax partly red, but it is the posterior section as follows: scutellum, metanotum and metapleuron, and propodeum. The male of *Analysson rufescens* and the putative male of *Alysson ruficollis* have no red on the thorax. So far as known this kind of sexual dimorphism in thoracic coloration occurs in all species of *Alysson* in which the female has the thorax partly or entirely red, e.g., the North American *A. melleus* Say and a presumed new species from Assam. I know of no *Alysson* males with the thorax partly or entirely red, and *Analysson rufescens* is the only known species in that genus.

Both sexes of *A. ruficollis* are readily distinguished from the other Ceylonese species of *Alysson* by the larger, less numerous areolets beside the transverse dorsal carina of the propodeum (Figure 3). The female has the anterior part of the thorax red and the forewing without an infumated spot, in contrast to *A. triangularis*, new species, in which the thorax is not partly red and the forewing has a transverse infumated band at the outer third. The front and vertex of the female head were said to be "thickly covered with black hair," a feature not found in any other *Alysson*.

The association of sexes is based on the similarly sculptured dorsal and posterior propodeal surfaces. Each sex is known from a single specimen, the female from Kandy, a locality in which I have collected only *A. triangularis*, new species, the male from Angunakolapelessa. The former locality is in the Wet Zone, the latter in the Dry Zone. The only known male of *A. ruficollis* was taken along a dry sandy stream bed. I suspect that Yerbury collected the only known female of this species in a sandy area along the Mahaweli River at Kandy. Most of my collecting in Kandy was done in the heavily forested Udawattakele Sanctuary. I collected along the Mahaweli River only once, at Peradeniya a few miles from Kandy.

FEMALE.—Type without head 4 mm long, so original length about 4.5 mm (Cameron said about 5 mm). Head said to be black, the following yellow [more likely creamy]: mandible except apex, palpi, labrum, clypeus, line along inner eye margin from near top, and antennal flagellum beneath; thorax and abdomen mostly black, the following red: pronotum except anteriorly in middle, scutum, scutellum, metanotum, and upper half of meso- and metapleura; the following creamy not yellow: apices of coxae, foretrochanter beneath, hind femur beneath at extreme base, anterior margin of foretibia, basal third of hind tibia, foretarsi, and pair of round lateral spots at middle third of second abdominal tergum; wings clear, stigma and veins brown. Vestiture of head said to be dense and black on front and vertex, clypeus and mandible with much longer white hair; elsewhere vestiture sparse and silvery.

Front and vertex said to be closely punctured; other characters of head are of coloration and vestiture as given above.

Pronotum dorsally with close small punctures, posteriorly with a narrow, deep, feebly crenulate groove except in middle, laterally with close small punctures anteriorly and a few close longitudinal carinae posteriorly above; scutum with small subcontiguous punctures; scutellum and metanotum with smaller, more dispersed punctures; mesopleuron with tiny sparse punctures; metapleuron smooth; dorsal and posterior propodeal surfaces with sculpture similar to that of male (cf. Figure 3) except lateral rugae within propodeal enclosure transverse rather than oblique.

Abdominal punctation and vestiture normal for *Alysson*; terga I–II impunctate except for sparse, scattered long setae on sides; terga III–IV (V retracted, not visible) with somewhat denser setae on basal half, apical half impunctate.

MALE.—Length 4.4 mm. Black, the following creamy: palpi, basal half of mandible, apical half of clypeus, narrow stripe along lower inner eye margin extending halfway to anterior ocellus, scape beneath, pair of tiny spots on pronotal disk, forecoxa beneath at apex, foretrochanter beneath, basal third of hind tibia, and a pair of small round lateral spots near anterior third of second abdominal tergum; the following light red: apex of mandible, basal five segments of

flagellum beneath, rest of forecoxa, midcoxa, inner margin of hind coxa, foretrochanter above, mid- and hind trochanters, rest of legs except the femora, tibiae, mid- and hind tarsi brownish above. Forewing clear except a small slight infumation adjacent to stigma.

Head width 2.5 times interocular distance at antennal insertions and 1.8 times that at anterior ocellus; flagellum beneath without a row of stout, longer erect setae, intermediate segments 1.1 times as long as wide, apical segment not enlarged and wider than penultimate; front with subcontiguous small punctures becoming a little sparser toward ocelli.

Pronotum with a narrow, weakly crenulate groove posteriorly, it and scutum with small punctures separated by about half the diameter of a puncture; side of pronotum with a few longitudinal carinae on upper half, elsewhere with scattered fine punctures; scutellum with a deep, coarsely crenulate anterior groove, elsewhere with scattered fine punctures; mesopleuron with well-developed scrobal sulcus and scattered fine punctures; metapleuron impunctate; dorsal and posterior surfaces of propodeum (Figure 3), areolets on either side of posterior transverse carina larger and fewer in number than in *A. triangularis* (Figure 5); lateral propodeal surface with fine sparse punctures on posterior half.

Abdominal punctation and vestiture as in female; genitalia very similar to those of *A. triangularis.*

SPECIMENS EXAMINED.—CENTRAL PROVINCE, *Kandy District:* 1♀, no locality label but stated to be Kandy in description (Oxford, the type).

UVA PROVINCE, *Monaragala District:* 1♂, Angunakolapelessa, 100 m, 21–23 Jan, K.V. Krombein et al. [collected along dry sandy stream bed] (USNM).

3. *Alysson triangularis*, new species

FIGURES 1, 5, 15, 21–23

Both sexes of the present species are readily distinguished from those of *A. ruficollis* Cameron, the only other Ceylonese *Alysson*. The propodeal areolets of *A. triangularis* are smaller and more numerous (cf. Figures 3, 5). In addition, the female of *A. triangularis* has no part of the thorax red and the forewing has an infumated band across the marginal, and second and third submarginal cells to the posterior wing margin; the female of *A. ruficollis* has the anterior part of the thorax red and the forewing lacks an infumated area.

It is possible that the two Ceylonese *Alysson* are restricted to different ecological niches. We collected all but one specimen of *A. triangularis* in the humid, densely forested Udawattakele Sanctuary in Kandy. Ritigala Natural Reserve, where we collected a single *A. triangularis*, is also a forested area. Our single male of *A. ruficollis* was taken along a dry sandy stream bed in thorn scrub jungle in the Dry Zone. Yerbury collected the only known female of *A. ruficollis* at Kandy, and I suspect that he caught it on sand along the Mahaweli River, an area where I collected only once, at Peradeniya a few miles away.

I collected two females of *A. triangularis* with leafhopper prey, each with a cicadellid female, *Idioscopus clypealis* (Lethierry). In Udawattakele Sanctuary the species probably nests in sloping or nearly vertical banks of soft sandstone (kudu gala), for I collected most specimens on or near such banks. I suppose that it is active throughout the year except during exceptionally dry periods; our specimens were taken during January, February, May, June, and September.

HOLOTYPE.—♀, Sri Lanka, Central Province, Kandy District, Kandy, Udawattakele Sanctuary, 6–8 Jun 1978, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, V. Kulasekare, L. Jayawickrema (USNM).

FEMALE.—Length 6.3 mm. Black, the following white to creamy: mandible except apex, clypeus except small median spot on base, stripe along inner eye margin narrowing gradually above and extending halfway to anterior ocellus, scape beneath, pair of transverse oval spots on pronotal disk, pair of subcircular spots on scutellum, fore- and midcoxae beneath, apex of hind coxa beneath, narrow streak anteriorly on foretibia, apical fourth of hind tibia, and pair of round anterolateral spots on tergum II; the fol-

lowing testaceous to pale red—streak beneath on fore- and midfemora and tibiae, apical segments of foretarsus and of midtarsus beneath. Wings clear except forewing with infumated area over most of marginal cell, apical third of first submarginal cell, second and third submarginals, becoming gradually weaker and evanescent toward posterior margin of wing; stigma and veins brown. Vestiture inconspicuous, mostly subappressed, silvery on head and thorax except cinereous on thoracic dorsum; some longer suberect silvery setae on clypeus, mesopleuron, femora beneath, sides of terga III–V, sterna II and VI and on apices of sterna III–IV.

Head width 2.2 times interocular distance at antennal insertions and 1.9 times that at anterior ocellus; clypeus and labrum (Figure 15 of paratype), apical margin of former trilobate, the middle lobe larger than lateral, labrum short, about as wide as lobate section of clypeus and with subtruncate apical margin; front with shallow median groove, with small, mostly subconfluent punctures; ocelli in an almost equilateral triangle, postocellar distance 0.8 times ocellocular distance and 0.6 times ocelloccipital distance.

Pronotum dorsally with small punctures separated by half to the full width of the diameter of a puncture, with a narrow crenulate groove posteriorly, lateral surface punctate anteriorly and with close oblique rugulae posteriorly; scutum with small subcontiguous punctures; mesopleuron with tiny punctures separated by several times the diameter of a puncture; dorsal and posterior propodeal surfaces with rugose reticulations smaller and more numerous than in *A. ruficollis*, lateral tooth well developed (Figure 5); lateral propodeal surface mostly glossy and impunctate anteriorly, posterior half with quite small punctures.

Abdominal punctation normal for *Alysson*.

ALLOTYPE.—♂, same locality as holotype but 1800 ft (550 m), 1–3 Sep 1980, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, L. Jayawickrema, V. Gunawardane (USNM).

MALE.—Length probably about 5.5 mm (terminal segments removed to extract genitalia). Black, the following white to creamy: mandible except apical third, stripe along inner eye margin narrowing above, extending halfway to anterior ocellus, scape beneath, fore- and midcoxae ventrally, hind coxa beneath at apex, narrow stripe anteriorly on fore tibia, and apical third of hind tibia; the following brownish yellow to light red—four basal flagellar segments beneath, and tarsi except apices. Vestiture much as in female. Wings clear except a very feeble, small infumation in marginal cell.

Head width 2.3 times interocular distance at antennal insertions and 1.8 times that at anterior ocellus; flagellum (Figures 21, 22) without a row of stout, longer erect setae beneath, intermediate segments 1.1 times as long as wide, apical segment (Figure 23) not enlarged and wider than penultimate; front with small, mostly subcontiguous punctures.

Pronotum with narrow posterior groove, crenulate except in middle, it and scutum with small punctures, many of them separated by about half the diameter of a puncture; side of pronotum with oblique rugulae somewhat sparser than in female, except posterior third with small punctures; scutellum with deep, coarsely crenulate, anterior groove, elsewhere with scattered small punctures; mesopleuron with well-developed scrobal sulcus and scattered fine punctures; metapleuron impunctate except a few small punctures above; propodeum much as in female.

Abdominal punctation and vestiture as in female; genitalia (Figure 1), paramere beneath with scattered, slender setae, digitus with a subbasal lobe possibly representing cuspis.

PARATYPES.—17♀, 2♂, same locality as holotype, as follows: 2♀, 1600 ft (490 m), 18–21 Jan 1977, K.V. Krombein, P.B. Karunaratne, P. Fernando, D.W. Balasooriya, V. Gunawardane; 4♀, 1♂, 2100 ft (640 m), 9–13 Feb 1975, K.V. Krombein, P.B. and S. Karunaratne, P. Fernando; 1♀, 2100 ft (640 m), 12 Feb 1975; K.V. Krombein (21275C with cicadellid prey); 1♀, 1700 ft (520 m), 29, 30 May 1976, K.V. Krombein, P.B. and S. Karunaratne, D.W. Balasooriya; 4♀, 1800 ft (550 m), 3–5 Jun 1976, K.V. Krombein, P.B.

and S. Karunaratne, D.W. Balasooriya; 1♀, 6 Jun 1978, K.V. Krombein (6778B with cicadellid prey); 3♀, 6–8 Jun 1978, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, V. Kulasekare, L. Jayawickrema; 1♀, 1♂, 1800 ft (550 m), 1–3 Sep 1980, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, L. Jayawickrema, V. Gunawardane; 1♀, 510–580 m, 8–10 Sep 1977, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, M. Jayaweera. 1♀, NORTH CENTRAL PROVINCE, *Anuradhapura District:* Ritigala Natural Reserve, 24, 25 Feb 1979, K.V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema, T. Gunawardane. Two females in the Colombo Museum (Udawattakele Sanctuary, 9–13 Feb 1975, same collectors as above on this date) are excluded from the type series because they are moldy. A pair of paratypes has been placed in the Colombo Museum, and a female paratype in the British Museum (Natural History).

Female paratypes are 6.2–7.0 mm long, and are very similar to the holotype in color and vestiture. Male paratypes are about 5.4 and 5.8 mm long, have sculpture similar to that of the allotype but differ in color as follows: both have a pair of quite small creamy spots on the pronotal disk and a pair of small, round, anterolateral spots on tergum II; and one also has the apical half of the clypeus pale and a pair of tiny round spots on the scutellum.

Subfamily NYSSONINAE

Bohart and Menke (1976:461–481) recognize 18 genera but only two of them occur in Sri Lanka, *Nysson* Latreille of the Holarctic, Oriental, and Ethiopian regions, and *Brachystegus* Costa of the Palaearctic, Ethiopian, and Oriental. Two other genera are known from India, and perhaps they will be found eventually in Sri Lanka.

Genus *Nysson* Latreille

Only one species, *Nysson rugosus* Cameron, is known from Sri Lanka. Several others occur in India, one or more of which may be found in Sri Lanka ultimately.

4. *Nysson rugosus* Cameron

Nysson rugosus Cameron, 1890:242, 243, pl. 9: fig. 13 [♀; Barrackpore, India; syntype series in Oxford University].—Handlirsch, 1895:823–825 [translation in German of Cameron's description].—Bingham, 1897:269 [redescription].—Dalla Torre, 1897:574 [listed].—Schulz, 1911:181–183 [erroneously synonymized *N. rugosus* under *N. doriae* Gribodo].—Maidl and Klima, 1939:135 [listed].—Bohart and Menke, 1976:469 [listed].

Nysson Horni Strand, 1913:110, 111 [♀; Matale, Ceylon; type now presumably in Institut für Pflanzenschutzforschung, Eberswalde, East Germany].—Maidl and Klima, 1939:135 [listed].—Bohart and Menke, 1976:469 [listed].—Krombein, 1984:11[suggested that *N. horni* was probably a synonym or subspecies of *N. rugosus*, and possibly a cleptoparasite of several species of *Bembecinus*]. New Synonymy.

? Brachystegus rugosus (Cameron), Pate, 1938:160 [*N. rugosus* tentatively assigned to *Brachystegus*].

Strand recognized that *N. horni* was close to *N. rugosus*, but described the former as new based on Cameron's erroneous description of the clypeal apex as being bidentate in the middle. The syntype series of *N. rugosus* has the clypeal apex rounded, as does the Ceylonese population. Strand's descriptive remarks agree well with the rest of Cameron's description, with the syntype series of *N. rugosus*, and with my specimens from Sri Lanka.

The species exhibits some variation in color but not enough to warrant recognition of separate subspecific status for the Indian and Ceylonese populations. The three syntypes of *N. rugosus* have tiny, white, posterolateral spots on abdominal terga III and IV in addition to larger spots on terga I and II. Only 17 of 228 Ceylonese specimens are similarly maculated, and 19 other specimens have tiny spots on III but not on IV. The hind tibiae are entirely red in one syntype, red beneath only in a second, and missing in the third. The hind tibiae are black in the Ceylonese specimens, except for 27 of them that have the hind tibiae red beneath, at least in part.

The three female syntypes in the Rothney

collection at Oxford University are conspecific. Two bear labels in Cameron's hand, "Nysson/rugosus/Cam.," but the "Cam." is omitted on one label. The third bears a printed label in red ink, "BARRACKPORE:/Rothney." The specimens are dirty and lack parts of the legs and antennae. I have selected as lectotype the specimen bearing the label, "Nysson/rugosus/Cam."

Nysson rugosus is the most abundant of the Ceylonese nyssonids. It occurs in both the Dry Zone and the Wet Zone but much more commonly in the former. It is restricted to altitudes ranging from sea level to about 100 m. Oddly enough, the species appears to be quite uncommon in India where it ranges at least as far north as Calcutta on the east coast. P.S. Nathan collected wasps extensively in South India, but I have seen only a pair from altitudes of 1000 and 1250 ft (305–380 m).

FEMALE.—Length 4.8–6.5 mm. Black, integument dull, the following red: mandible except base and apex, flagellum beneath, fore- and mid-femora beneath rarely, hind femur (rarely black), hind tibia beneath rarely, first abdominal tergum entirely except for pale spots (rarely only in middle), second tergum varying from basal half to anterolaterally only, first sternum (rarely entirely black), second sternum except apical half rarely; the following white to creamy—base of mandible, apex of scape beneath, stripe on pronotal dorsum narrowly interrupted in middle, pronotal lobe, small bar at base of scutellum, forecoxa and apices of mid- and hind coxae beneath, spot on base of fore- and mid tibia, the former rarely with a streak, spot on apices of all tibiae, posterolateral propodeal tooth, first two abdominal terga apically with a narrow transverse stripe broadly interrupted in middle and not extending to side, tergum III with a tiny posterolateral spot occasionally, and tergum IV with such a spot rarely. Vestiture silvery, short, and appressed, dense only on propodeal dorsum laterad of basal enclosure. Wings slightly infumated, more strongly so anteriorly in marginal cell, stigma black, veins dark brown.

Eyes diverging above, interocular distance at anterior ocellus 1.6 times that at base of clypeus; apical margin of clypeal lobe rounded; frontal carina low, rounded, extending one-third toward anterior ocellus; upper front contiguously pitted; posterior ocelli without ridge or tubercle along inner margin.

Pronotal dorsum not ridged anteriorly; scutum, scutellum, and mesopleuron contiguously pitted, more coarsely so than front; scutellum with lateral margins slightly raised; propodeal enclosure with coarse longitudinal rugae dorsally; posterolateral propodeal tooth short, blunt; posterior propodeal surface with a pair of median ridges laterad of which are oblique rugulae.

Abdomen with small punctures separated by once or twice the diameter of a puncture on terga I and II, becoming larger and more crowded toward apical margin of terga III–IV; pygidium with sides converging in an acute angle at apex, tip narrowly rounded, surface slightly convex and with small contiguous pits.

MALE.—Length 4.3–6.0 mm. Color and sculpture as in female; tergum VII with acute posterolateral tooth, apex between teeth emarginate; apical margin of sternum VII rounded and with a row of dense short setae.

SPECIMENS EXAMINED (all Krombein et al. and USNM except as noted).—NORTHERN PROVINCE, *Jaffna District*: 1♂, Kilinochchi, 80 ft (25 m), 24–27 Jan. *Mannar District*: 5♀, 6♂, 0.5 mi (0.8 km) NE Kokmotte Bungalow, Wilpattu National Park, 50–100 ft (15–30 m), 10–11 (♀) and 22, 23 Jan (1♀, 2♂), 15, 16 Feb (♀, 4♂), 21–25 May (2♀); 2♀, 1♂ Ma Villu, Cashew Corporation, 28 Jan, Karunaratne et al. (♀, ♂, Colombo), 17–21 Feb (♀); 1♀, 3♂, Kondachchi, Ma Villu, 11, 12 Apr, ♀ in Malaise trap; 2♀, 10♂, Silavathurai, Kondachchi, 23–27 Jan, Karunaratne et al. (♀ in Malaise trap) (1♀, 3♂, Colombo); 3♀, 1♂, Marichchukkaddi, 25, 26 Jan, Karunaratne et al. (♀, Colombo).

NORTH CENTRAL PROVINCE, *Anuradhapura District*: 1♂, Galapitawewa, 19 Mar, Karunaratne et al. *Polonnaruwa District*: 1♀, Pimburettawa, 13 mi (20.8 km) S Mannampitiya, 1850 ft (565 m), 9–12 Nov, Flint et al.

EASTERN PROVINCE, *Trincomalee District*: 8♀, 6♂, Trincomalee, China Bay Ridge Bungalow, 0–100 ft and 0–30 m, 26 Feb (3♀, 4♂), 13–17 May (4♀, 1♂), 24, 25 Jul (♀), 8–11 Oct (♂). *Amparai District*: 1♀, 2♂, Inginiyagala, 10 Jun; 1♀, 3♂, Lahugala Sanctuary, 15 Jun; 39♀, 61♂, Ekgal Aru Sanctuary Jungle or Tank, 100 m, 19–22 Feb (9♀, 7♂), 9–11 Mar (11♀, 9♂), 9–12 Jun (14♀, 31♂), 4–7 (3♀, 2♂), 5, 6 Jul (2♀, 12♂ (1♂ in Malaise trap, 1♂ in yellow pan trap)).

CENTRAL PROVINCE, *Matale District*: 3♂, Kibissa, 0.5 mi (0.8 km) W Sigiriya, 1–3 Mar (♂), 28 Jun–4 Jul (2♂). *Kandy District*: 3♀, 2♂, Kandy, Udawattakele Sanctuary, 2100 ft (640 m), 9–13 Feb (2♀), 18–20 Mar (♂), 23–27 Apr (♀, ♂); 1♀, Kandy Reservoir Jungle, 10 Feb; 1♂, Peradeniya Botanical Gardens, 13 Feb; 1♀, Hasalaka irrigation bungalow, 5 mi (8 km) NW Mahiyangana, 30 Mar–9 Apr, in Malaise trap, Spangler et al.

NORTH WESTERN PROVINCE, *Kurunegala District*: 11♀, 7♂, Kurunegala, Badegamuwa Jungle, 24–27 Jan (5♀, 1♂), 14, 15 Mar (5♀, 2♂), 20 Sep (♀, 4♂).

WESTERN PROVINCE, *Colombo District*: 13♀, 8♂, Labugama Reservoir Jungle, 2–6 Feb (11♀, 8♂) and 16 Feb (2♀); 1♂, Ratmalana Airport, 13 Jan.

SABARAGAMUWA PROVINCE, *Kegalla District*: 1♀, Kitulgala, Parawalathanna, 20–22 Feb, in Malaise trap, Hubbard et al.; 2♀, 3♂, Kitulgala, Makande Mukalana, 3, 4 Feb (1♀ in Malaise trap). *Ratnapura District*: 2♀, 4♂, Gilimale, Induruwa Jungle, 2 (♂) and 5–7 Feb (♀, 3♂), 26 Mar (♀); 1♀, Weddagala, Sinharaja Jungle, 18–21 Jun; 3♀, 9♂, Uggalkaltota, 150 ft (45 m), 20 (♂) and 23–26 Jun (3♀, 8♂).

UVA PROVINCE, *Badulla District*: 4♀, 4♂, Ulhitiya Oya, 15 mi (24 km) NNE Mahiyangana, 5, 6 Sep. *Monaragala District*: 1♂, 13 mi (20.8 km) E Uda Walawe, on sand along Mau Aru, 16 Jun; 2♀, 22♂, Angunakolapelessa, 100 m, 21–23 Jan (♀, 13♂ (♀, 2♂ in Malaise trap)), 27, 28 Mar (1♀, 3♂ (2♂ in Malaise trap)), 17–19 Jun (6♂).

SOUTHERN PROVINCE, *Galle District*: 2♀, 2♂, Kanneliya section, Sinharaja Jungle, 11–16 Jan (♂ in Malaise trap). *Hambantota District*: 1♀, Palatupana, WLNPS Bungalow, 0–50 ft (0–15 m), 18–22 Jan; 1♂, Bundala Sanctuary, Circuit Bungalow, 5–50 ft (2–15 m), 22–24 Aug.

Genus *Brachystegus* Costa

Two species of *Brachystegus* occur in Sri Lanka, *B. dubitatus* (Turner) and *B. basalis* (Smith). Other species are known from India, one or more of which may be found eventually in Sri Lanka.

5. *Brachystegus dubitatus* (Turner)

FIGURE 9

Nysson dubitatus Turner, 1914:255 [♀; Coimbatore, South India; holotype in British Museum (Natural History)].—Turner, 1917:184 [♂, Pusa, India; description].—Maidl and Klima, 1939:135 [listed].

Brachystegus dubitatus (Turner).—Pate, 1938:160 [tentatively assigned to *Brachystegus*].—Bohart and Menke, 1976:473 [listed as synonym of *B. decoratus* (Turner)].

Brachystegus dubitatus and *B. decoratus* (Turner) are discrete species, not synonyms. Both species were described from Coimbatore, South India, the former from a unique female, the latter from a pair of which Turner designated the male as type. Turner's key distinguished the females by the red first abdominal segment of *B. dubitatus*. The legs of *B. dubitatus* were described as red (black in *B. decoratus*), and the size smaller, 6 mm as contrasted to 9 mm for the females.

I have seen Turner's types of the two species as well as two additional females of *B. decoratus* from South India, and a pair of *B. dubitatus* from South India and a single female from Sri Lanka. The color differences of the legs are confirmed in the two species, as well as a size difference, *B. dubitatus* (♀, 5.8–6.3 mm; ♂, 6.7) being smaller than *B. decoratus* (♀, 8.0–9.5; ♂, 8.0). The base of the dorsal surface of the first abdominal segment is more thinly silvery tomentose in *B. dubitatus*. The extent of yellow abdominal markings also is different. In *B. decoratus* the dorsum is yellow with a narrow black median line, the lateral yellow spots covering almost the whole exposed area of segments II–V and the dorsal surface of I. In *B. dubitatus* the yellow spots are

more widely separated and narrower, the normally exposed bases of the segments being dark. Finally, the apex of tergum VII is bidentate in the male of *B. dubitatus*, the apical margin being concave, whereas in *B. decoratus* the apical margin appears tridentate because the margin between the lateral teeth is noticeably convex.

Brachystegus dubitatus must be more widely distributed in Sri Lanka than is indicated by my single specimen from Labugama Reservoir Jungle at an altitude of 100–150 m in the Wet Zone with an average annual rainfall of some 2400 mm. This species and its congener, *B. basalis* (Smith), are very uncommon both in Sri Lanka and India. Their rarity is exceptional considering that the only other Ceylonese nyssonine, *Nysson rugosus* Cameron, is both ubiquitous and extremely abundant in Sri Lanka.

The following description is based on the available three females and one male from Sri Lanka and India.

FEMALE.—Length 5.8–6.3 mm. Black, the following yellow: basal third or half of mandible, small spot laterad of and behind posterior ocelli, streak on basal half or more of outer surface of anterior tibia, tip of posterolateral propodeal spine, and large posterolateral spots on terga I–V, decreasing in size after II, moderately separated on midline; the following light red—rest of mandible except tip, occasionally scape, flagellum beneath on basal half or more, legs except yellow area on fore tibia, first segment except yellow areas and occasionally in middle posteriorly, and sterna II and VI except only base of II in Sri Lanka specimen. Vestiture dense, appressed, silvery on clypeus, front, temple, pronotal dorsum, mesopleuron, propodeal dorsum except enclosure, and sternum II, thinner on upper part of declivous surface of tergum I. Wings slightly infumated in marginal cell and apically, stigma and veins brown.

Eyes diverging above, interocular distance at anterior ocellus 1.6 times that at base of clypeus; clypeal apex thickened, bare, bidentate in middle; frontal carina moderately developed and extending about one-third toward anterior ocellus; upper front with large pits, those near ocellar area narrowly separated, both the pits and interspaces with dense tiny punctures from which the tomentum arises (Figure 9); posterior ocelli with low oblique ridge along inner margin.

Pronotal dorsum with a transverse ridge; scutum, scutellum, and mesopleuron contiguously pitted, the pits larger than on front; propodeal enclosure dorsally with a few longitudinal rugae, posteriorly irregularly rugose; posterolateral propodeal tooth moderately developed; posterior propodeal surface with a few longitudinal rugulae in middle, laterad of which are some rugulae radiating outward and upward from abdominal insertion.

Disk of tergum I with moderately large, subcontiguous punctures, some at apex larger; punctation of terga II–V becoming successively smaller, subcontiguous except for a few larger ones apically; pygidium strongly convex, closely and moderately punctate, apex rounded, distance between lateral carinae at base 0.8 times length of pygidium; sternum II gently convex toward base.

MALE.—Length 6.7 mm. Coloration and vestiture as in female except anterior tibia without yellow streak.

Sculpture as in female except as follows: last flagellar segment enlarged, concave beneath; tergum VI posteriorly with a lateral carina that terminates as a backwardly directed tooth; apical margin of tergum VII emarginate so that apex appears bidentate with rounded teeth.

SPECIMENS EXAMINED.—WESTERN PROVINCE, *Colombo District*: 1♀, Labugama Reservoir Jungle, 2–4 Feb, Krombein et al. (USNM).

INDIA, *South India*: 1♀, Coimbatore, 23 Jan, T.V.R. coll. (London; type); 1♂, Tranquebar, Apr, Nathan (Corvallis); 1♀, Kurumbagaram, Karikal Terr., Apr, Nathan (Corvallis).

6. *Brachystegus basalis* (Smith), new combination

FIGURE 8

Nysson basalis Smith, 1856:355 (♂, India; type in Hope Department of Entomology, Oxford University).—Gerstaecker, 1867:112 [listed].—Handlirsch, 1887:401

[translation into German of original description].—Bingham, 1897:269, 270 [quotation of original description].—Dalla Torre, 1897:567 [listed].—Turner, 1914:254, 255 [♂, ♀; South and West India].—Maidl and Klima, 1939;134 [listed].—Bohart and Menke, 1976:469 [listed].

Smith's unique male type is indubitably a *Brachystegus*, not a *Nysson*, for it possesses the apical fringes of dense, long, curled setae on sterna II–V and the irregularly serrate outer surface of the hind tibia that characterize the former genus but are lacking in *Nysson*. The type is on a short pin bearing a small rectangular label that is blank on the upper surface and bears a scrawled "Ind." on the lower. It is 9.1 mm long and agrees well with most of the specimens examined.

The rarely collected *B. basalis* occurs in Sri Lanka at low altitudes from near sea level to about 150 m. We collected only two females and a male, and I have seen one other male from Sri Lanka. I have also examined two females and seven males from India including the type. Typically the pale markings are ivory but they are pale yellow in a male from Tranquebar, South India, and bright yellow in a male from Colombo, Sri Lanka. Also two males from Moyar Camp, Nilgiri Hills and Coimbatore, both South India, have light red rather than dark femora and tibiae.

FEMALE.—Length 7.0–9.1 mm. Black, the following ivory: small round spot behind and laterad of posterior ocellus and transverse oval posterolateral spots on terga I–IV, those on I large, on II slightly smaller, and III–IV quite small; mandible reddish except basally and at tip, and occasionally anterior tibia beneath and middle tibia entirely. Vestiture appressed, silvery, quite dense on lower part of front, temple, pronotal dorsum, mesopleuron and -sternum, coxae and femora beneath, upper half of declivous surface of tergum I, sternum II, and particularly dense on clypeus and dorsal propodeal surface laterad of enclosure. Wings slightly infumated except marginal cell and apex of forewing more strongly so; stigma and veins brown.

Eyes diverging above, interocular distance at base of clypeus 0.6 times that at anterior ocellus; clypeal apex bare, thickened, bidentate in middle; frontal carina stronger than in *B. dubitatus*, extending 0.4 times distance to anterior ocellus; upper front with large, mostly contiguous pits bearing many micropunctures from which tomentum arises (Figure 8), interspaces between pits not micropunctate.

Pronotal dorsum weakly ridged; scutum, scutellum and mesopleuron contiguously pitted, the pits larger than on front and in *B. dubitatus*; propodeal enclosure dorsally with a few longitudinal rugae, posteriorly irregularly rugose; posterolateral propodeal tooth moderately developed, somewhat stouter than in *B. dubitatus*; posterior propodeal surface with a few longitudinal rugulae in middle that enclose weak small rugulose reticulations, laterad of which are a few rugulae radiating outward and upward from abdominal insertion and enclosing larger, weak, rugulose reticulations.

Disk of tergum I with moderately large subcontiguous punctures that become more separated laterally, interspaces with small punctures; terga II–IV with more scattered, larger punctures except posteriorly, and with abundant small punctures in interspaces between large ones; tergum V with subcontiguous, moderately large punctures; pygidium convex but not so strongly as in *B. dubitatus*, closely and moderately punctate, apex rounded, distance between lateral carinae at base 0.7 times length of pygidium; sternum II gently convex toward base.

MALE.—Length 7.1–9.2 mm. Color and vestiture as in female except tergum V frequently with small posterolateral spot (present in type), pale markings pale or bright yellow in two of eight specimens, and femora and tibiae light red in two.

Sculpture as in female except as follows: last flagellar segment enlarged, concave beneath and more strongly so than in *B. dubitatus*; tergum VI posteriorly with a lateral carina that terminates in a backwardly directed tooth; apical margin of tergum VII narrowly rounded out between lateral teeth so that apex appears tridentate.

SPECIMENS EXAMINED.—EASTERN PROVINCE, *Trincomalee District*: 1♀, 1♂, Trincomalee, China

Bay, 0–30 m, 8–11 Oct, Krombein et al. (USNM).

WESTERN PROVINCE, *Colombo District*: 1♂, Colombo, Mar, Wickwar (Colombo); 1♀, Labugama Reservoir Jungle, 2–4 Feb, Krombein et al. (USNM).

INDIA. 1♂, no other data (Oxford; Smith's type); 1♂, Quetta, Aug (London); 1♂, Coimbatore, on bush, Fletcher (London); 1♀, Nasik, Bombay Presidency (London); 2♂, Coimbatore, South India, Aug, Sep, Nathan (USNM, Corvallis); 1♂, Moyar Camp, Nilgiri Hills, South India, 2900 ft (885 m), May, Nathan (Corvallis); 1♂, Tranquebar, South India, Feb, Nathan (Corvallis).

Subfamily GORYTINAE

Only four of the 31 genera recognized by Bohart and Menke (1976:481–523) are known to occur in Sri Lanka, *Argogorytes* Ashmead, *Lestiphorus* Lepeletier, *Ammatomus* Costa and *Hoplisoides* Gribodo. I have seen specimens of an apparently undescribed species of *Dienoplus* Fox from central and southern India, so that taxon may be found ultimately in Sri Lanka.

Genus *Argogorytes* Ashmead

One decidedly anomalous species, *Argogorytes caerulescens* (Turner) is endemic in Sri Lanka. I have seen an undescribed species from India that may be found eventually in Sri Lanka.

7. *Argogorytes caerulescens* (Turner)

FIGURES 10, 14

Gorytes caerulescens Turner, 1914:251 [♀; Kandy, Ceylon; type in British Museum (Natural History)].—Maidl and Klima, 1939:55 [listed].

Argogorytes caerulescens (Turner).—Bohart and Menke, 1976:492 [listed].

This rare species is known from only two females, the type from Kandy, presumably Udawattakele Sanctuary, and a specimen from Weddagala in the Sinharaja Jungle. These localities are at altitudes of 100–640 m, and have an average annual rainfall of 1950–3900 mm. *Argogorytes caerulescens* is distinguished from its congeners as well as the other Ceylonese nyssonids by the metallic blue integument.

The genus *Argogorytes* is a diverse group, and I suspect that eventually the species may be allocated to two or more genera or subgenera. A primary division in the genus may be into a group of relatively few species having a narrow pygidium with few setae in the female and a larger group with a broad triangular pygidium densely clothed with decumbent setae (Figures 13, 14). These pygidial characters are similar to those in the crabronid genus *Lestica*, in which females of the subgenus *Solenius* have the narrow pygidium whereas in typical *Lestica* the female pygidium is broad and triangular. Some species of *Solenius* are known to nest in sound or rotten wood, while several of typical *Lestica* nest in the soil. I surmise that similar biological characters may separate these two groups of species in *Argogorytes*. Females of the group with a broad pygidium nest in the soil (Callan, 1980), but the nesting habits of those with a narrow pygidium are unknown.

Argogorytes caerulescens is unique in the genus in that it has a more robust form, the pronotal collar is elevated anteriorly into a narrow lamella, the forewing costa is not curved outward near base, and abdominal terga II–IV have a narrow, reflexed, apical lamella (Figure 10). Other unusual features, which, however, are found in a few other *Argogorytes*, are the presence of an apical spur on the outer surface of the fore- and midtibiae, plantulae present on tarsal segments I–IV, abdominal terga II–IV without an apical fringe of dense short setae, and the narrow, subparallel-sided, female pygidium.

FEMALE.—Length 11–12 mm. Body form more robust than in other *Argogorytes*; head, thorax, and abdomen metallic blue, antenna and legs black. Wings infumated, forewing more strongly so, stigma black, veins dark brown. Vestiture short, silvery, erect and denser on head, sparser on thorax, somewhat denser on abdomen, rather abundant, dense silvery pile on median and posterior parts of second abdominal sternum, and posterolaterally on sterna III–V.

Head height from apex of clypeus to occiput 0.9 times width; eyes slightly diverging above, inner margin slightly emarginate halfway between antennal insertions and anterior ocellus; interocular distance at base of clypeus 0.95 times that at anterior ocellus; clypeus twice as wide as high, apical margin in middle shallowly incurved, surface with scattered large punctures interspersed among dense small punctures; lower half of front with contiguous small punctures and a weak median carina, upper half with somewhat larger punctures, many of them separated by half the diameter of a puncture; vertex punctation similar to that on upper front; temples with rather dense small punctures.

Pronotal collar with an anterior, transverse, low, erect lamella; scutum anterolaterally with contiguous small punctures, elsewhere with large contiguous punctures or pits; scutellum in middle with a narrow, transverse, raised smooth area, posteriorly with a small circular pubescent pit, elsewhere with contiguous punctures a bit smaller than those on scutum; metanotum similarly punctate, slightly raised in middle; mesopleuron adjacent to pronotal lobe coarsely, closely pitted, remainder with strong, close, oblique to longitudinal ridges with fine, interspersed, minute, piliferous punctures; metapleuron smooth with moderately dense, fine, piliferous punctures; triangular propodeal enclosure with coarse, slightly irregular longitudinal rugae margined laterally by short oblique rugae, the rest of dorsal area with longer oblique rugae; posterior propodeal surface with rugulae radiating outward and upward from abdominal insertion; lateral propodeal surface mostly smooth but with a curved posterolateral ruga; fore- and mid-tibiae with an apical spur on outer surface; plantulae present on tarsal segments I–IV.

Abdominal terga I–III with small punctures mostly separated by 0.5–1.0 times the diameter of a puncture, tergum IV with smaller, similarly spaced punctures except a narrow anterior strip closely punctate, tergum V with fine, moderately dense punctures; terga II–IV with a narrow reflexed lamella at apex (Figure 10); pygidium (Figure 14) narrow, moderately short, sub-parallelsided, with a rounded median ridge and a lateral groove bearing a few setiferous punctures; first sternum with a strong complete median keel; sternum II raised into a median rounded prominence about a third from base.

MALE.—Unknown.

SPECIMENS EXAMINED.—CENTRAL PROVINCE, *Kandy District*: 1♀, Kandy, Nov, O.S. Wickwar (type; London).

SABARAGAMUWA PROVINCE, *Ratnapura District*: 1♀, Sinharaja Forest, Weddagala, 18–21 Jun, Krombein et al. (USNM).

Genus *Lestiphorus* Lepeletier

There is only one species in Sri Lanka, the rarely collected endemic *Lestiphorus greenii* (Bingham). Another species occurs in India and may be collected ultimately in Sri Lanka.

8. *Lestiphorus greenii* (Bingham)

FIGURE 7

Gorytes greenii Bingham, 1896:444, 445, pl. 15: fig. 8 [♀; Pundal(u)oya, Ceylon; type in British Museum (Natural History)].—Bingham, 1897:272, 274 [misspelled *greeni*; redescription].

Gorytes (Ammatomus) greeni [sic] Bingham.—Maidl and Klima, 1939:64 [listed].

Lestiphorus greenii (Bingham).—Bohart and Menke, 1976: 506 [listed].

This rarely collected species is known only from the unique female type collected by E.E. Green in Pundaluoya. The area around this village ranges from 1067 to 1219 m in altitude, and has an average annual rainfall of 2160 mm. Bingham (1896) mentioned that, when captured, the type was "carrying off a Homopterous insect with which to store her nest."

The species is readily distinguished from other Ceylonese nyssonid wasps by a combination of the petiolate abdomen, non-clavate antenna, and the presence of an anterior vertical ridge on the mesopleuron. Presumably the unknown male will agree with the female in the characters cited in the foregoing key except that the sixth abdominal tergum is likely to have an apical yellow band.

Lestiphorus greenii is unique in the genus because of the rugulose sculpture of the scutum, scutellum, metanotum, meso- and metapleura, the finely rugulose reticulations of the area adjacent to the propodeal enclosure and on the posterior slope of the propodeum, and the more slender first abdominal segment (cf. Figures 6, 7).

FEMALE.—Length 13.7 mm. Black, the following light red: clypeus, flagellum beneath except apical segments, tegula, legs except outer surfaces of mid- and hind femora and tibiae infuscated, base of first abdominal tergum and a subapical band, basal third of second tergum, apical bands on third to fifth sterna and all of sixth; the following yellow: mandible except apical third, narrow band extending along inner eye margin from base of clypeus two-thirds of distance to anterior ocellus, scape beneath, narrow band on pronotal apex extending onto lobe, narrow lateral stripe on scutum, broad band on scutellum, narrow apical band on metanotum, small spot on mesopleuron beneath forewing, narrow apical band on first abdominal tergum, broad stripe on apical third of second, narrow apical bands on third to fifth, and posterolateral blotch on second sternum. Wings clear except infuscation covering marginal and almost all of second and third submarginal cells; stigma testaceous, veins brown. Vestiture quite short, dense but inconspicuous, mostly appressed or subappressed except erect on propodeum and first abdominal tergum.

Clypeus 2.6 times as wide as long, apical margin subtruncate on median third, then rounding toward eye; inner eye margins converging slightly above, interocular distance at posterior ocelli 0.9 times that at clypeal base; front with a shallow, median, impressed groove extending to anterior ocellus, dull from dense small punctures among which are some dispersed larger punctures; posterior ocelli slightly closer to eyes than to each other.

Scutum with dense small punctures and many weak longitudinal rugulae; scutellum with a narrow crenulate groove anteriorly, rest of surface as well as metanotum with stronger longitudinal rugulae than scutum; meso- and metapleura with close longitudinal rugulae; groove delimiting propodeal enclosure evanescent, surface with 15 coarse longitudinal rugulae; propodeal surface adjacent to enclosure and posterior slope with rugulose reticulations of fine mesh.

First abdominal segment (Figure 7) more slender than in most *Lestiphorus* (Figure 6), apex not abruptly constricted; pygidium glossy, rather sparsely punctate.

SPECIMEN EXAMINED.—CENTRAL PROVINCE, *Nuwara Eliya District*: 1♀, Pundaluoya, Green (London; type).

Genus *Ammatomus* Costa

This Old World genus occurs in the Oriental, Ethiopian, and Palaearctic regions. The closely related New World *Tanyoprymnus* Cameron, formerly considered a subgenus of *Ammatomus*, occurs only in the Nearctic Region.

A peculiar feature of females of a number of species of *Ammatomus* and of *T. moneduloides* (Packard), the only known species of that genus, is the presence of what Pulawski (1973) and Bohart and Menke (1976:511, 512) considered to be a carina along the posterior margin of the forefemur at the juncture of the rather flattened ventral surface of the femur and the rounded upper surface. This, however, is not a carina but a brush of stiff, short, flattened setae as may be seen with a stereoscopic microscope at ×100.

Scanning electron micrographs of *A. alipes* (Bingham) show clearly the nature of this peculiar structure. Viewed in profile (Figures 34, 35) the brush is found to be composed of flattened agglutinated setae. Viewed from above (Figures 36, 37) the apices of the setae meet in a sharp edge along the femur. Presumably glandular secretions cause the agglutination, because rubbing the brush gently with a fine insect pin causes the setae to fluff out (Figures 38, 39). The function is moot but the brush may play some role in attracting males by dispersing a pheromone or the secretions may be used in nesting in the soil. We know nothing of mating behavior in *Amma-*

tomus. Our knowledge of nest construction in members of the genus is so scanty that we have no clue as to possible differences in nesting behavior between species possessing this brush and those that do not.

The female of *A. alipes* has another peculiarity on the forefemur near the base of the rounded upper surface near the anterior margin. This structure appears as a bare scaly area (Figure 29) at ×250, but at ×3000 (Figure 30) the "scales" are revealed to be low, rounded imbricate ridges. Their function is unknown but may be stridulatory. I have not examined other species of *Ammatomus* for this structure.

Bohart and Menke (1976:511, 512) state that males of both *Ammatomus* and *Tanyoprymnus* lack a fimbria of setae at the base of some of the abdominal sterna. This is not so, as may be demonstrated by exposing the bases of the normally hidden fifth and sixth sterna. Each fimbria consists of several rows of contiguous, rather long setae across the middle of the sternum (Figures 27, 28).

9. *Ammatomus alipes* (Bingham)

FIGURES 11, 27–30, 34–39

Gorytes alipes Bingham, 1897:273, fig. 78 [♀, ♂; Bombay, Malabar coast, Tenasserim; syntypes in British Museum (Natural History)].

Ammatomus alipes (Bingham).—Turner, 1912:373 [transferred to *Ammatomus*].—Bohart and Menke, 1976:513 [listed].

Gorytes (Ammatomus) alipes Bingham.—Maidl and Klima, 1939:64 [listed].

Bingham described this species from both sexes from the localities cited above. There are four specimens in the British Museum that could qualify as syntypes. One is a female bearing labels, "TENASSERIM/Maulmein/8-89-BINGHAM COLL.", "Gorytes/alipes/Bingh.♀/TYPE" and a B.M. type label, "21.1,511". A second female bears only a label, "Bombay/Dist.", on the reverse of which is written, "77/111." A male bears a label, "Bombay/Downes," and another label, "60.15/E.I.C." Another male, lacking a head, bears only a blue disc on which is written, "78/89." The 77, 60, and 78 refer to the years in the 1800's when the respective specimens were accessioned. The first three specimens are conspecific, and I have selected the Tenasserim specimen as lectotype. The last specimen belongs to an undescribed species of *Ammatomus*.

Ammatomus alipes is the largest of the three Ceylonese species of the genus, females being 8.3–10.0 mm long as compared to 6.5–8.6 mm, and has certain other distinctions. The pale markings are lemon yellow rather than paler yellow, creamy, or white. The legs have very few red markings, these being restricted to the ventral surfaces of the mid- and hind femora and foretibia, rather than being predominantly red. The scutum has smaller, sparser punctures (cf. Figures 11, 12), and the first transverse cubital vein has a short stub at the lower end that extends into the first submarginal cell. The first abdominal tergum has a complete, sharp, lateral carina. The female has the posterior margin of the forefemur margined by a dense brush of short flattened setae (Figures 34–36) that give it the appearance of being sharply edged, quite unlike the forefemur in its male and in the female of *A. xerophilus*; the female of *A. amatorius* also has such a brush. The male differs markedly from *A. amatorius* (Smith) in having a low, rounded median tubercle beneath on the third to eighth flagellar segments; the male of *A. xerophilus* is unknown.

All of our specimens were collected at three localities in the Wet Zone with average annual rainfall of 2400–3900 mm. However, two males were collected by Wickwar at Wellawaya in the Dry Zone. The species is widely distributed in India and occurs also in Burma.

The following description is based on Ceylonese specimens. I have seen more than 40 specimens from South India that vary in that the stub of the first transverse cubital vein is evanescent or absent in a few, and two males lack the flagellar tubercles. Also, the yellow markings are usually more extensive, the bands on abdominal terga may be broader and entire, the thoracic

markings may be larger, and there may be a small yellow spot above on the mesopleuron.

FEMALE.—Length 8.3–10.0 mm. Black, the following lemon yellow: palpi, middle of mandible, clypeus, supraclypeal area, narrow line along inner eye margin from clypeus to upper margin of antennal insertion, scape, pronotum with a very narrow posterior line and lobe, scutum with small posterolateral spot, metanotum in middle with a narrow apical band sometimes interrupted on midline, small spot at apex beneath of fore- and midcoxae, fore- and midfemora beneath in part or almost entirely, base of fore- and hind tibiae on outer surface and stripe on entire mid-tibia outwardly, tarsi except apical half of last segment of hind pair, and subapical stripes on abdominal terga I–IV all interrupted in middle, that on I more widely so; the following red: apex of mandible, fore- and midfemora beneath in part and foretibia. Wings clear, stigma and veins brown, first transverse cubital vein with a short stub near lower end extending into first submarginal cell. Vestiture short, silvery, appressed, densest on clypeus, then on front, then on thorax, and abdomen with only a bloom in certain lights; pygidium with dense, brown, subappressed setae beneath which is reddish golden pile.

Apical width of clypeus 1.5–1.6 times height; least interocular distance 0.3 times that at posterior ocelli, and 0.15 times head width; postocellar line twice ocellocular line; median frontal groove extending to anterior ocellus; upper front and area laterad of ocelli with smaller punctures than in *A. amatorius* and *A. xerophilus*, mostly separated by half or more the diameter of a puncture.

Scutum with smaller punctures than in *A. amatorius*, anterolaterally most of them separated by one or more times the diameter of a puncture (Figures 11, 12); mesopleuron also with smaller punctures, many of them in irregular rows separated by several times the diameter of a puncture, but many punctures in a row mostly separated from each other by half the diameter of a puncture; posterior margin of forefemur apparently sharply edged, the edge consisting of dense, short, flattened setae (Figures 34–36); propodeal enclosure not glossy anteriorly, with dense micropunctures and a few scattered small punctures; first transverse cubital vein with a short stub near lower end extending into first submarginal cell.

MALE.—Length 7.3–9.6 mm. Black, the following lemon yellow: clypeus, supraclypeal area and adjacent small spot along inner eye margin, scape, narrow line posteriorly on pronotum and lobe, band laterally on scutum gradually narrowing posteriorly, scutellum, metanotum, spot on mesopleuron beneath tegula, forefemur, midfemur except above at base, small spot at apex of hind femur, tibiae, tarsi, apical bands on terga I–V, broadened laterally on I–III, narrower and not quite reaching sides on IV–V, small median spot on VI; apical flagellar segments light red beneath. Wings and vestiture as in female.

Other characters as in female except as follows: flagellar segments III–VIII beneath with a small median tubercle; and posterior margin of forefemur rounded, not fringed with dense, short, flattened setae.

SPECIMENS EXAMINED (all USNM and Krombein et al. except as noted).—WESTERN PROVINCE, *Colombo District*: 1♂, Padukka, Arakawila Jungle, 26 Nov, Karunaratne.

SABARAGAMUWA PROVINCE, *Ratnapura District*: 1♀, Weddagala, Sinharaja Jungle, 18–21 Jun.

UVA PROVINCE, *Monaragala District*: 2♂, Wellawaya, Wickwar (London); 1♀, 1♂, Telulla, 11, 12 Dec, Wickwar (Colombo).

SOUTHERN PROVINCE, *Galle District:* 6♀, Kanneliya section, Sinharaja Jungle, 11–16 Jan (♀ in Malaise trap), 13–16 Jul (2♀, 1 in Malaise trap), 13–16 Aug (3♀).

MISCELLANEOUS: 1♀, no label data (Colombo).

10. *Ammatomus amatorius* (Smith)

FIGURE 12

Gorytes amatorius Smith, 1875:39, 40 [♀; lectotype in Hope Entomological Collections, Oxford University].—Handlirsch, 1887:536, 537 [translation to German of original

description].—Cameron, 1890:240, 241, pl. 9: fig. 15 [Barrackpore and Bombay, India; redescription].—Handlirsch, 1895:857 [translation to German of Cameron's redescription].—Bingham, 1897:273, 274 [♀, ♂; Barrackpore, Bombay; redescription].—Dalla Torre, 1897:536 [listed].

Ammatomus amatorius (Smith).—Turner, 1912:374 [suggested that *A. rufonodis* Radoszkowski might be a synonym].

Gorytes (Ammatomus) amatorius Smith.—Maidl and Klima, 1939:64 [listed].

This species was described by Smith in a paper on new Indian Hymenoptera collected by Rothney. Specific localities were mentioned for some species, but none was given for *G. amatorius* and there was no indication whether there was one or more specimens. Smith stated in his introduction, "A * is prefixed to those species of which the types are in the National Collection [i.e., British Museum]." The heading *Gorytes amatorius* was not so marked.

The presumptive unique type is a female in the Rothney Collection, Hope Entomological Collections, Oxford University. It bears Smith's handwritten label, "Gorytes/amatorius/Smith," above which is a tiny square label bearing only a handwritten "13." The specimen agrees well with Smith's description except that it is 8 mm long rather than 7, the mandible is white basally and red at apex instead of entirely red, and the fore- and midfemora are white beneath at apex rather than the tibiae. I suspect that Smith erred in his description of the color of the mandible, and wrote tibiae rather than femora when he described that coloration, because all specimens that I have seen have the mandibles and femora as in Smith's specimen. The coloration of the terminal hind tarsal segment could not be ascertained because these are now missing. I have designated as lectotype this female bearing Smith's label.

A spurious type, perhaps not even a syntype, is in the British Museum. It bears several labels, a small blue one with "India" written upon it, a printed label, "F.Sm.Coll./79-22," and a label in Smith's handwriting identifying it as "genus deleted/species deleted/New Gen. et/Species." (I have not given Smith's generic and specific names to avoid creation of nomina nuda.) The specimen also bears a small red-bordered disc with "Holo-/type" printed thereon in red; this label may have been affixed by Turner (1912). It is a specimen of *A. amatorius*. My reasons for not considering it a syntype are that it is a male, not a female, and that it is not labeled *Gorytes amatorius* in Smith's handwriting.

The species is very similar to *A. xerophilus*, new species, but differs from it in having creamy rather than white maculations, area around anterior ocellus with coarser contiguous punctures, forefemur sharply edged beneath on posterior margin rather than rounded, apical third of propodeum glossy and impunctate, and first abdominal segment stouter, 1.1 times as long as wide rather than 1.6 times.

All of our specimens were collected at altitudes not exceeding 150 m. The species occurs in both the Dry Zone and the Wet Zone in Sri Lanka with average annual rainfall of 965–2400 mm. It is widely distributed in India also.

FEMALE.—Length 6.5–7.1 mm. Black, the following creamy to pale yellow: palpi, mandible at base, clypeus, supraclypeal area, short, narrow line along inner eye margin, scape and pedicel beneath, narrow posterior margin of pronotum and lobe, short posterolateral stripe on scutum, band on middle of metanotum, stripe on apical half of fore- and midfemora posteriorly, outer half or third of tibiae, tarsi except last segment of hind pair, transverse subapical band on tergum I narrowly interrupted in middle, and narrow subapical bands on terga II–IV, that on IV not reaching sides; the following red: middle of mandible, flagellum beneath, mid- and hind coxae, trochanters, most of fore- and mid- and all of hind femora, fore- and midtibiae beneath, side of abdominal tergum I and all of sternum I. Wings clear, stigma and veins brown. Vestiture short, appressed, silvery, not so dense on clypeus and supraclypeal area as in *A. xerophilus*, less dense on front and mesopleuron, less dense elsewhere; black on pygidium.

Apical width of clypeus 1.8 times height; least

interocular distance 0.4 times that at posterior ocelli and 0.2 times head width; postocellar line 3.3 times ocellocular line; median frontal groove extending to anterior ocellus; upper front and area laterad of ocelli with rather coarse, mostly contiguous punctures.

Scutum (Figure 12) anterolaterally with coarse, mostly subcontiguous punctures; mesopleuron with larger punctures subcontiguous to separated by about half the diameter of a puncture; propodeal enclosure glossy on posterior third with a few scattered minute punctures, anteriorly dull and with more numerous smaller punctures and a few scattered larger ones; first transverse cubital vein of forewing without a stub extending into first submarginal cell.

First abdominal segment stouter, 1.0–1.2 times as long as wide, tergum with lateral carina evanescent beyond spiracle.

MALE.—Length 7.0–7.5 mm. Color, vestiture, and sculpture very like those of female except clypeus 1.3–1.4 times as wide as high, postocellar line 4.5–4.8 times as long as ocellocular line, propodeal enclosure glossy with a few scattered small punctures, except anterolaterally dull and densely micropunctate; as compared to male *A. alipes*, flagellar segments not tuberculate below, abdominal sternum VI with larger, contiguous punctures, and first abdominal segment 1.3–1.6 times as long as wide.

SPECIMENS EXAMINED (all USNM).—NORTHERN PROVINCE, *Vavuniya District*: 2♀, Parayanalankulam, irrigation canal, 25 mi (40 km) NW Medawachchiya, 100 ft (30 m), 20–25 Mar, Davis et al.

NORTH CENTRAL PROVINCE, *Anuradhapura District*: 2♀, Hunuwilagama, Wildlife Society Bungalow, near Wilpattu National Park, 200 ft (60 m), 10–19 Mar, Davis et al.

EASTERN PROVINCE, *Trincomalee District*: 1♀, Trincomalee, China Bay Ridge Bungalow, 0–50 ft (0–15 m), 24, 25 Jul, Krombein et al.

WESTERN PROVINCE, *Colombo District*: 1♀, Kalatuwawa Reservoir, 2, 3 Feb, in Malaise trap, Krombein et al., 3♂, Labugama Reservoir, 16 Feb, Krombein et al.

UVA PROVINCE, *Badulla District*: 3♀, Ulhitiya Oya, 15 mi (24 km) NNE Mahiyangana, in Malaise trap, 5, 6 Sep, Krombein et al. *Monaragala District*: 1♀, Angunakolapelessa, 100 m, 21–23 Jan, Krombein et al.

11. *Ammatomus xerophilus*, new species

This uncommon species has been collected only twice, both at low xeric localities in the Dry Zone where the average rainfall is 860–965 mm and the altitude is 15–30 m.

The strongly diverging inner eye margins, clavate antennal flagellum, absence of an omaulus anteriorly on the mesopleuron, and petiolate abdomen distinguish it from all other Ceylonese nyssonids except its congeners and *Lestiphorus greenii* (Bingham). It is readily separated from *A. alipes* (Bingham) and *A. amatorius* (Smith) by a combination of the pale white rather than yellow or creamy markings, the rounded rather than sharply edged posterior margin of the forefemur, and the more slender first abdominal segment (length to width as 1.6:1 rather than 1.4 or less:1). Although the male of *A. xerophilus* is unknown, it should be very similar to the female in sculpture and color inasmuch as there is such slight sexual dimorphism in *Ammatomus*.

ETYMOLOGY.—The specific name is derived from the Greek *xeros* (dry) and *philia* (fondness), in allusion to the preferred habitat.

HOLOTYPE.—♀; Sri Lanka, Southern Province, Hambantota District, Palatupana Tank, 15 m, in Malaise trap, 29 Mar–2 Apr 1981, K.V. Krombein, T. Wijesinhe, L. Weeratunge (USNM).

FEMALE.—Length 6.6 mm. Black, the following white: palpi, clypeus, supraclypeal area, narrow short stripe along lower inner eye margin, scape except narrow stripe above, pedicel and first flagellar segment beneath, narrow stripe on posterior margin of pronotum and the lobe, narrow lateral stripe on scutum extending from posterior margin two-thirds toward anterior margin, transverse band on apical margin of metanotum, apical half of fore- and midfemora beneath, base narrowly of fore- and midtibiae, in-

ner surface of foretibia, spot near apex of hind tibia externally, fore- and midtarsi, and narrow subapical bands on terga I–V and sterna II–III; the following red: mandible, apical half of flagellum beneath, legs except white areas noted above and forecoxa, outer surfaces of tibiae, hind metatarsus, base and side of first abdominal tergum, and first sternum. Wings clear, stigma and veins brown. Vestiture short, appressed, silvery, quite dense on clypeus and supraclypeal area, less dense on front and mesopleuron, rather inconspicuous elsewhere; dark brown with some reddish golden pile beneath on pygidium.

Apical width of clypeus 1.7 times height; least interocular distance 0.4 times that at posterior ocelli and 0.2 times head width; postocellar line 4.3 times ocellocular line; median frontal groove extending two-thirds distance to anterior ocellus; upper front and area laterad of ocelli with smaller punctures than in *A. amatorius*, mostly separated by at least half the diameter of a puncture.

Scutum anterolaterally with coarse, mostly subcontiguous punctures; mesopleuron with larger punctures subcontiguous to separated by about half the diameter of a puncture; propodeal enclosure with dense micropunctures and irregular, scattered larger punctures, apex not glossy; first transverse cubital vein in forewing without a stub extending into first submarginal cell.

First abdominal segment comparatively slender, 1.6 times as long as wide, tergum with lateral carina not extending beyond spiracle.

MALE.—Unknown.

PARATYPE.—♀, Northern Province, Vavuniya District, Parayanalankulam, along irrigation canal, 100 ft (30 m), 25 mi (40 km) NW Medawachchiya, 20–25 Mar 1970, Davis and Rowe (USNM). The paratype is 8.6 mm long and agrees very well with the holotype in color and sculpture. It will be deposited in the Colombo Museum.

Genus *Hoplisoides* Gribodo

Three species groups have been formally recognized in the New World for a number of Nearctic species but none of the Old World species has been assigned to species groups.

Hoplisoides pictus (Smith) from Sri Lanka and India, *H. thalia* (Handlirsch) from South Africa and Lesotho, and an apparently undescribed species from Nigeria belong to the *pictus* Group, hitherto unrecognized. It is probable that other species from the Oriental and Ethiopian regions should be assigned here, but my material from those areas is very limited. None of the Palaearctic species available for study belongs to the *pictus* Group. The secondary sexual characteristics of males of the *pictus* Group are particularly remarkable. No other group has a peculiar hind tarsal pecten (Figure 20), and in no other group do the hypostomal and occipital carinae meet, their juncture marked by an acute tooth (Figures 17, 18).

The *pictus* Group is characterized as follows: occipital carina almost extending to hypostomal carina in female, both of them meeting in male, juncture between them with pronounced tooth (Figures 17, 18); male clypeus with lateral fascicle of curved setae (Figure 19); male sternaulus with or without an elevation or tooth at midpoint; lower metapleural pit larger than anterior ocellus; and male hind tarsal segments enlarged, segments II–IV with a pecten (Figure 20) formed by a long curved seta at inner apical angle of each.

12. *Hoplisoides pictus* (Smith)

Gorytes pictus Smith, 1856:365 [♀; Madras; type in British Museum (Natural History)].—Handlirsch, 1888:537 [translation to German of original description].—Cameron, 1890:240 [suggested it was only a variety of *G. orientalis* Handlirsch].—Handlirsch, 1895:893 [mentioned Cameron's 1890 suspicion].—Bingham, 1897:275, 276 [♀, Barrackpore, Calcutta, Madras; redescription].

Gorytes (Hoplisoides) pictus Smith.—Maidl and Klima, 1939:89 [listed].

Hoplisoides pictus (Smith).—Bohart, in Bohart and Menke, 1976:521 [listed *G. capitatus* Nurse in error as a synonym].

I have examined the unique female type of *Gorytes pictus* Smith from Madras. It is conspecific

with a series of 16 females and 10 males from India and Pakistan, and with the four available *Hoplisoides* from Sri Lanka. Both sexes were taken at Deesa and Coimbatore, India, and in Karachi, Pakistan.

Gorytes capitatus Nurse (1902:86) is not a synonym of *H. pictus* as Bohart believed. The unique type (London) is a male, not a female as Nurse stated in his description. The confusion as to its sex was probably because the usually exposed seventh tergum is entirely retracted beneath the sixth so that the abdomen appears to be that of a female. Also, the flagellum is only slightly modified beneath, an unusual condition in *Hoplisoides* males. Nurse's species is known only from the type male and a male topotype from Deesa. It is distinguished from *H. pictus* by having a pair of large ivory spots on the propodeum and wide ivory bands on terga I, II, IV, and V. The propodeal spots are lacking or tiny in *H. pictus* and pale bands are present on terga I through III or IV but never on V. Among other differences male *H. capitatus* lacks the hind tarsal pecten and the occipital carina does not meet the hypostomal carina as in *H. pictus*. The unknown female of *H. capitatus* may be expected to have more extensive pale markings than the female of *H. pictus*.

Hoplisoides pictus is distinguished from other Ceylonese nyssonids by the non-petiolate second submarginal cell, the infumation in the marginal, second and third submarginal cells, non-clavate flagellum, inner eye margins not diverging strongly above, and the non-petiolate abdomen. It exhibits considerable variation in the extent of erythrism as detailed in the following descriptions. The few Ceylonese females are noticeably erythristic, perhaps because all are from rather xeric parts of the country. The type from Madras also is very erythristic. The yellow markings also vary in extent, and three females from Karachi and three males from Coimbatore, Deesa, and Karachi have ivory or white rather than yellow markings.

We collected three specimens of this rather uncommon species on sand or sandy loam at three localities in the more xeric parts of the Dry Zone at altitudes of 100 m or less.

FEMALE.—Length, 10.0 mm. Black, maximum erythrism as follows: mandible in middle, usually apex of clypeus, antenna, scutum, most of mesopleuron, metapleuron, legs except pale maculations, propodeum except enclosure and middle of posterior surface, abdominal segment I except pale apical band on tergum, tergum II except apex and occasionally in middle, base of sternum II and sternum VI; minimum erythrism as follows—middle of mandible, antenna, narrow line laterally on scutum, legs except pale maculations, propodeum except enclosure and middle of posterior surface, abdominal segment I except pale apical band on tergum, side of tergum II narrowly, anterolateral spot on sternum II and apex of sternum VI; the following usually yellow, occasionally ivory—basal third or less of mandible, clypeus except apex, narrow stripe along inner eye margin usually extending two-thirds toward anterior ocellus, short narrow streak along eye on gena, scape beneath, broad posterior pronotal margin and lobe, scutellum except extreme base, short band on metanotum, large subtriangular spot on mesopleuron below tegula, apical spot beneath on fore- and midfemora, stripe on outer surface of midtibia, stripe on basal half of outer surface of hind tibia, apical bands on abdominal terga I–IV, that on IV usually broader but absent in Karachi specimens, and narrower bands present or not on apices of sterna II–IV. Wings clear, an infumated spot covering most of marginal and second and third submarginal cells, stigma yellow, veins brown. Vestiture very short, appressed, silvery, not conspicuous except on clypeus; exposed part of tergum V with dense, short, suberect, brown setae.

Clypeus 2.6 times as wide as long, apex slightly emarginate across middle; interocular distance at base of clypeus 0.9 times that at anterior ocellus and half the head width; posterior ocelli closer to eye than to each other (1 : 1.2).

Metapleuron with weak longitudinal rugulae on lower half, posterior margin completely foveolate, height of lower pit 1.3 times diameter

of anterior ocellus; propodeal enclosure with a median, weakly foveolate groove, elsewhere with close, slightly radiating rugulae that extend almost to sides.

Pygidium closely punctate, weakly rugulose, the sides meeting at about an angle of 45°.

MALE.—Length 8.2–10.3 mm. Black, erythrism less than in female, maximum as follows: flagellum beneath, trochanters and femora except pale areas, occasionally large blotch on upper section of lateral propodeal surface, first abdominal tergum except pale apical band occasionally preceded by a dark stripe, tergum II anterolaterally, sterna I and II except posterolateral pale spot on latter; minimum erythrism as follows—flagellum beneath, trochanters and femora except pale areas, abdominal tergum I except apical third with median black spot followed by white band, side of tergum II, sternum I and II except posterolateral spot; the following yellow, creamy or white—basal half or more of mandible, labrum, clypeus, broad band along inner eye margin extending two-thirds toward anterior ocellus, scape beneath, apical margin of pronotum including lobe, broad apical band on scutellum, occasional transverse bar on postscutellum, small or larger triangular spot on mesopleuron below tegula, mid- and hind coxae beneath entirely or in part, blotch at apex of fore- and midfemora, tibiae except streak on outer surface of fore tibia, fore- and midtarsi, hind metatarsus, apical bands of variable width on terga I–IV, that on IV broadest but occasionally reduced to narrow median line, and occasional posterolateral spot on sternum II. Wings and vestiture similar to female except second abdominal sternum with dense, short, suberect setae, and fifth tergum without dense, short, erect setae.

Face (Figure 19), interocular distance at antennal insertions 0.8 times that at anterior ocellus and 0.4 times head width; clypeus depressed laterally and with a fascicle of long curled setae; many of flagellar segments concave or otherwise modified beneath (Figures 31–33); posterior ocelli closer to eye than to each other (1 : 1.1); an acute tooth at juncture of hypostomal and occipital carinae (Figures 17, 18).

Thorax similar to female except sternaulus weakly elevated at middle but not dentate; hind tarsus with a pecten of long setae along inner margin (Figure 20); radiating rugulae of propodeal enclosure sometimes not extending to lateral groove.

Second abdominal sternum without a lateral longitudinal swelling as in *H. thalia*.

SPECIMENS EXAMINED (all Krombein et al. and USNM except as noted).—NORTHERN PROVINCE, *Jaffna District*: 1♀, Jaffna, Nov, Wickwar (Colombo).

EASTERN PROVINCE, *Amparai District*: 1♀, Ekgal Aru, 19 Jun.

UVA PROVINCE, *Badulla District*: 1♀, Ulhitiya Oya, 15 mi (24 km) NNE Mahiyangana, 5, 6 Sep. *Monaragala District*: 1♀, Mau Aru, 10 mi (16 km) E Uda Walawe, 100 m, 24–26 Sep.

INDIA, *South India*: 1♂, South Malabar, Walayar Forests, 1000 ft (305 m), Sep, Nathan (Corvallis); 2♂, Moyar Camp, Nilgiri Hills, 2600 ft (795 m) Apr, and 2900 ft (885 m) Jan, Nathan (Corvallis); 1♀, Coimbatore, Nov–Dec, Nathan (London); 1♂, Coimbatore, 25 Sep–1 Oct, yellow pan trap, Noyes (London). *Central India*: 1♂, Jabalpur, 1600 ft (490 m), Aug, Nathan (Corvallis). 1♀, Patancheru, Hyderabad, Jul–Sep, Malaise trap, Bernays & Woodhead (London); 2♀, no. 5 [probably Barrackpore], Cameron coll. (London); 1♂, Bombay Presidency (London); 2♀, 1♂, Deesa, Sep, Nurse (London); 1♂, Bengal Presidency, Nuddea District, Mischindipore, 80 mi (128 km) from Calcutta (London).

PAKISTAN: 6♀, 2♂, Karachi, 1♀ in Oct, 3♀ coll. by Comber (London).

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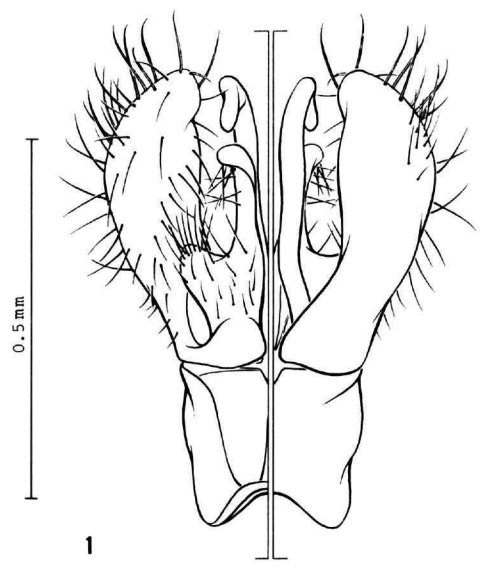
FIGURES 1, 2.—Male genitalia of Alyssoninae, ventral aspect at left, dorsal at right: 1, *Alysson triangularis,* new species; 2, *Analysson rufescens,* new genus and species.

FIGURES 3–5.—Dorsal and posterior aspects of propodeum of Alyssoninae: 3, male *Alysson ruficollis* Cameron; 4, female *Analysson rufescens,* new genus and species; 5, female *Alysson triangularis,* new species.

FIGURES 6, 7.—Dorsal aspect of abdominal segment I, female *Lestiphorus:* 6, *L.* species from India; 7, *L. greenii* (Bingham).



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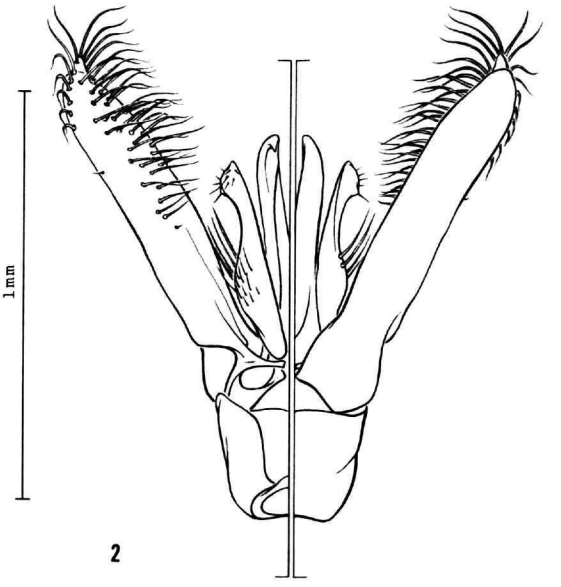

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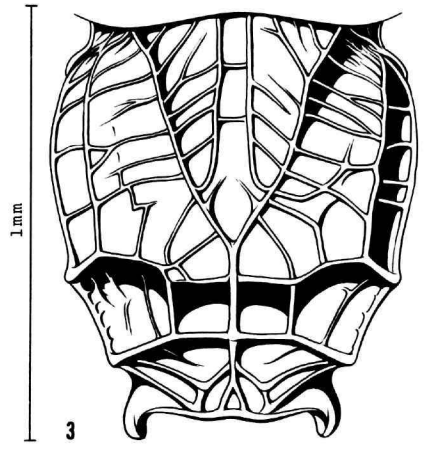

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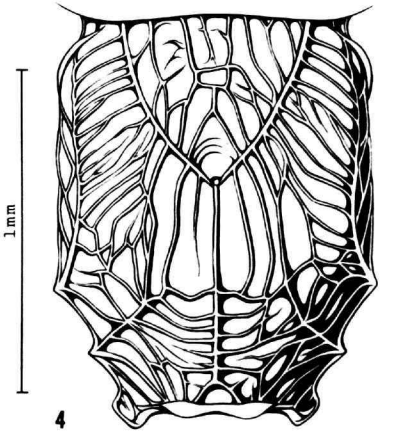

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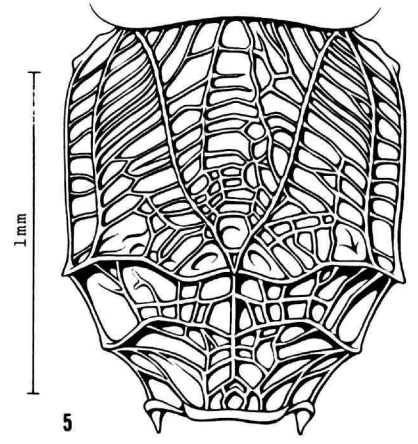

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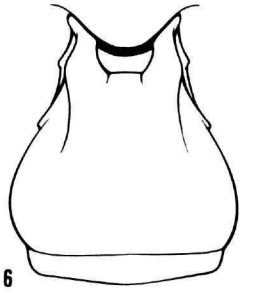

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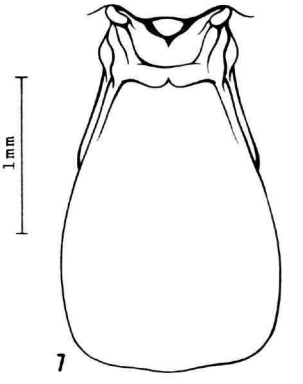

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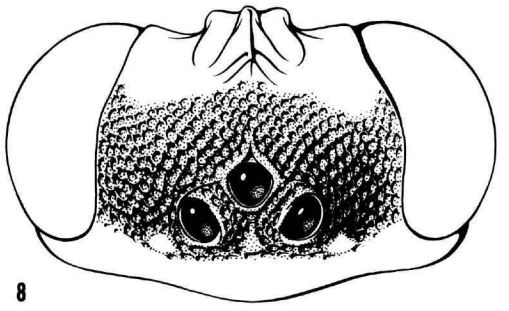
FIGURES 8, 9.—Dorsum of head, female *Brachystegus:* 8, *B. basalis* (Smith); 9, *B. dubitatus* (Turner).

FIGURE 10.—Lateral view of abdomen, female *Argogorytes caerulescens* (Turner).

FIGURES 11, 12.—Scutum, female *Ammatomus:* 11, *A. alipes* (Bingham); 12, *A. amatorius* (Smith).

FIGURES 13, 14.—Pygidium, female *Argogorytes:* 13, *A. nigrifrons* (Smith) from North America; 14, *A. caerulescens* (Turner).



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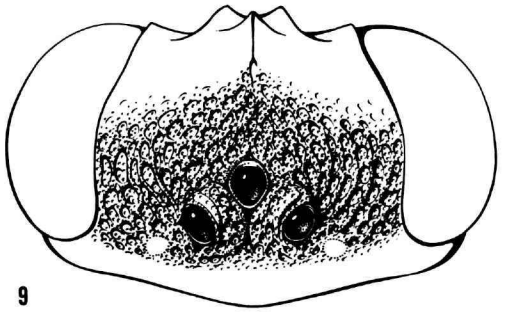

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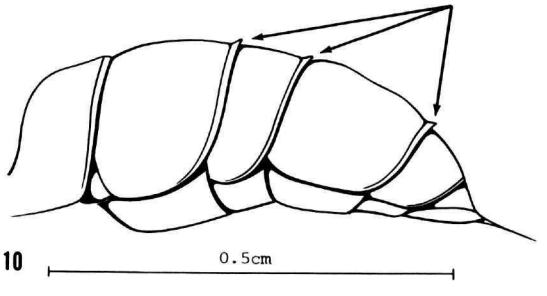

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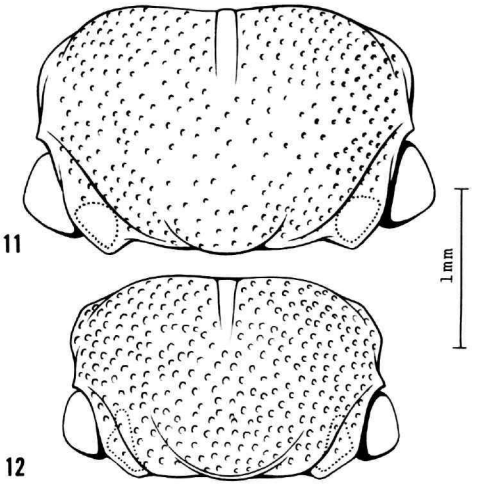

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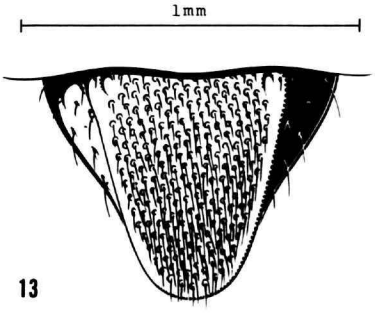

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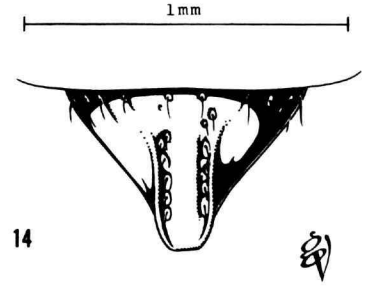

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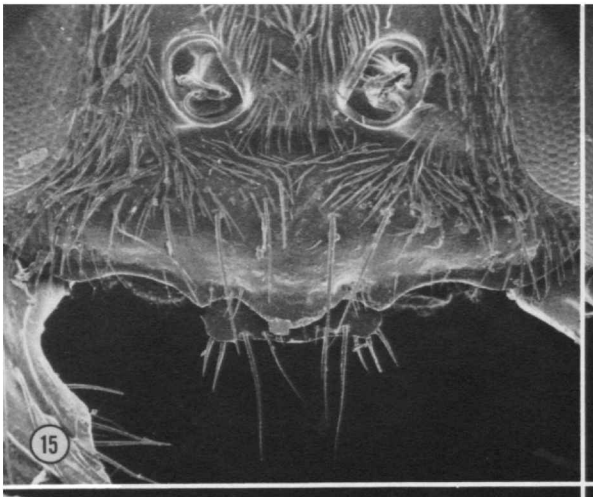
FIGURES 15, 16.—Lower part of front, female Alyssoninae: 15, *Alysson triangularis,* new species, antennae removed (× 58); 16, *Analysson rufescens,* new genus and species (× 62).

FIGURES 17–20.—Male *Hoplisoides pictus* (Smith): 17, lateral aspect of lower part of head (× 42); 18, oblique view of head beneath (× 26); 19, lower part of front, antennae removed (× 50); 20, ventral aspect of posterior tarsus (× 30). (o = occipital carina, h = hypostomal carina.)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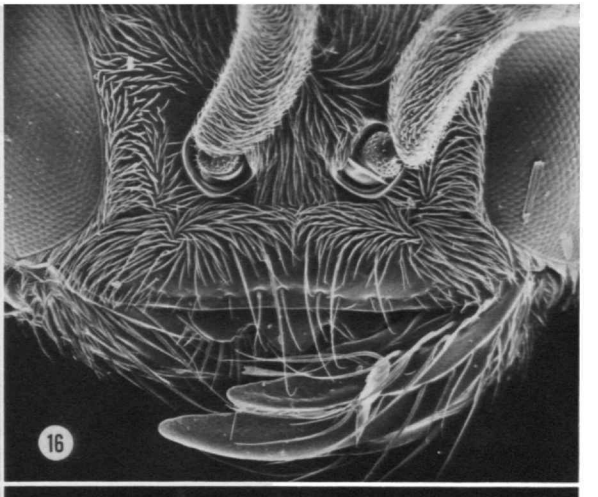
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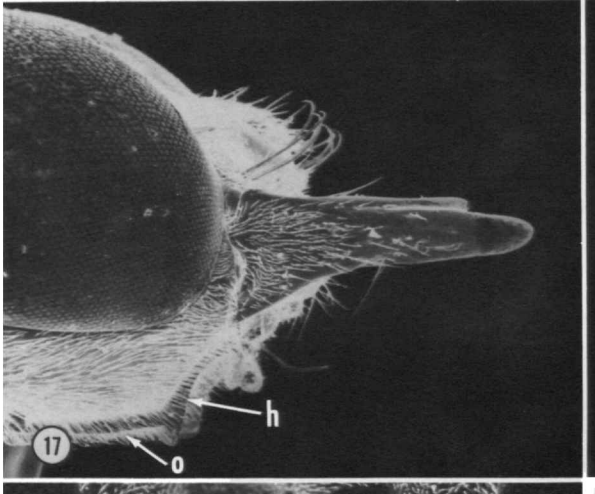
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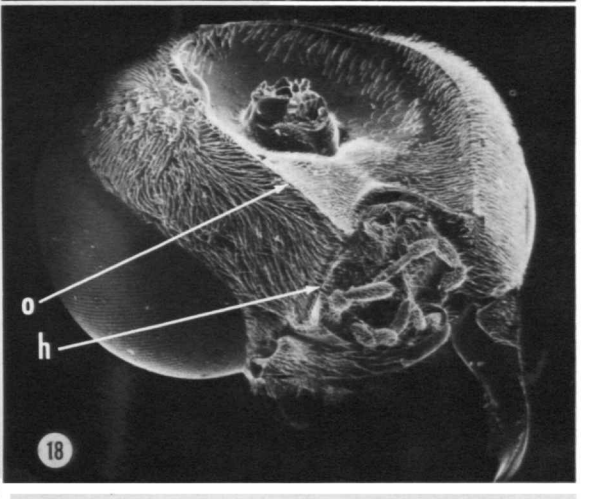
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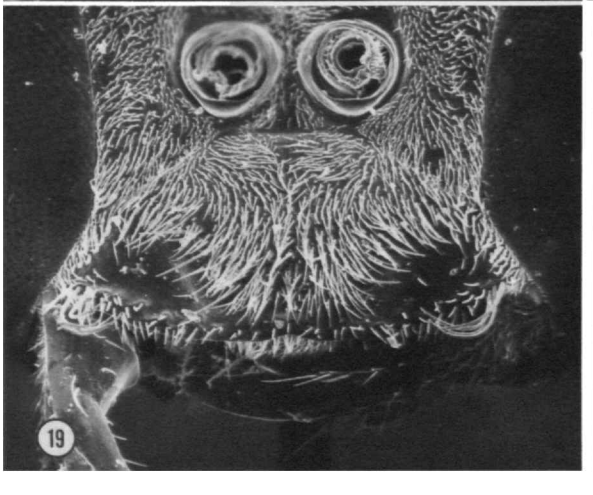
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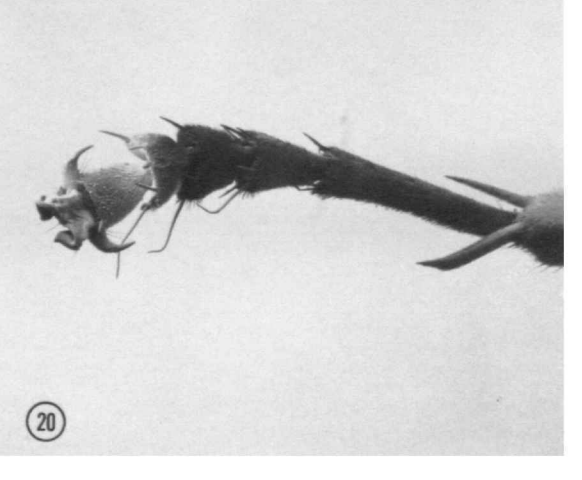
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FIGURES 21–23.—Male antenna, *Alysson triangularis,* new species: 21, flagellum in lateral view (× 64); 22, intermediate flagellar segments (× 120); 23, terminal flagellar segment (× 280).

FIGURES 24–26.—Male antenna, *Analysson rufescens,* new genus and species: 24, flagellum in lateral view (× 68); 25, intermediate flagellar segments (× 120); 26, terminal flagellar segment (× 232).


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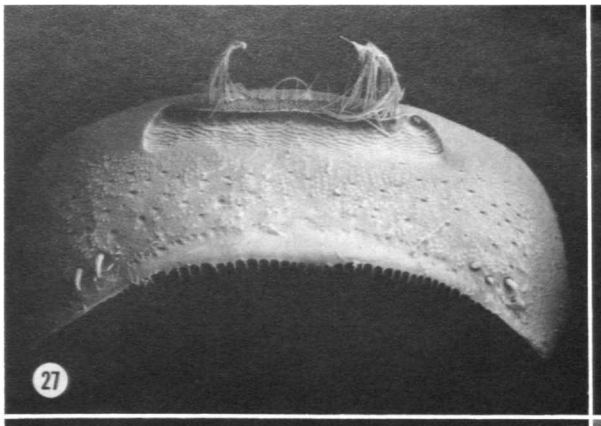
FIGURES 27, 28.—Abdominal sterna, anterior margin above, male *Ammatomus alipes* (Bingham), some setae denuded: 27, segment V (× 48); 28, segment VI (× 57).

FIGURES 29, 30.—Stridulatory (?) area near base of fore femur, female *Ammatomus alipes* (Bingham): 29, (× 193); 30, (× 2424).

FIGURES 31–33.—Male antenna, *Hoplisoides pictus* (Smith): 31, lateral aspect (× 26); 32, last two flagellar segments beneath showing placoids (× 64); 33, placoid of terminal flagellar segment (× 352).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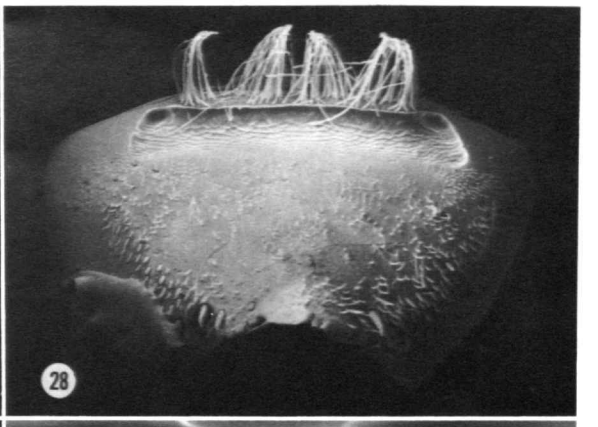
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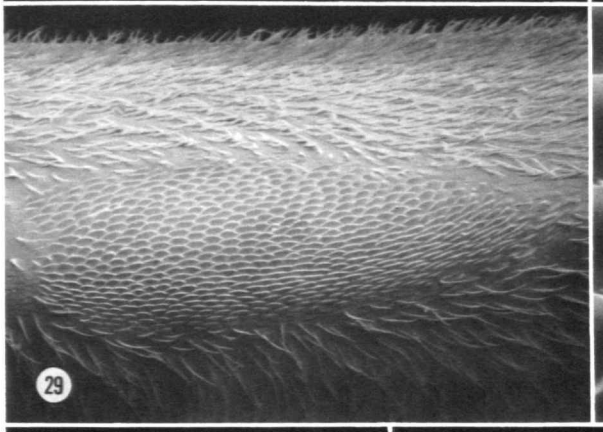
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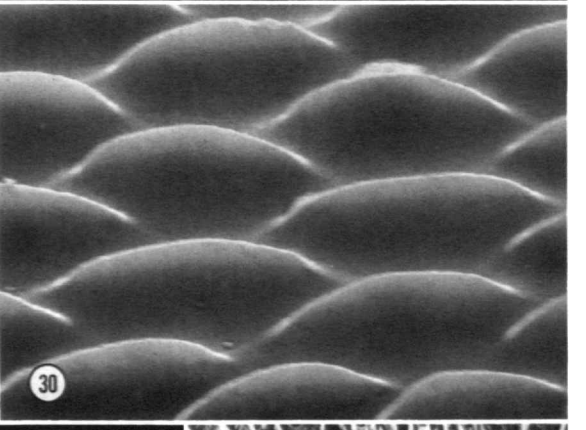
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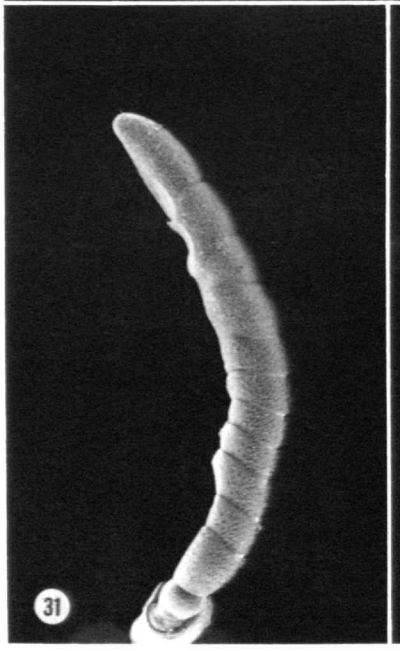
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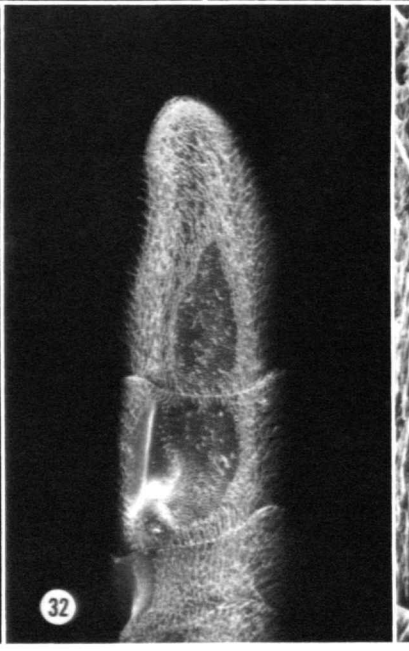
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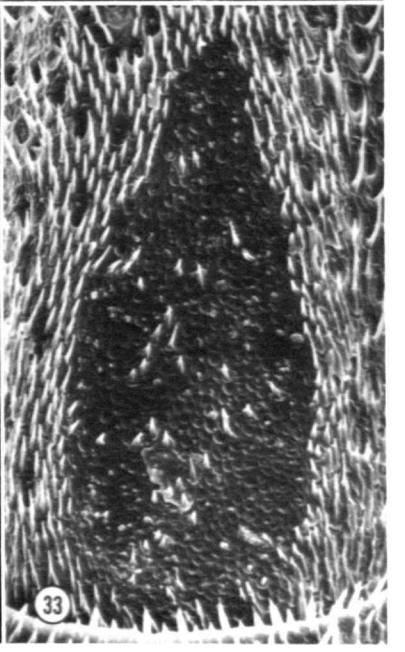
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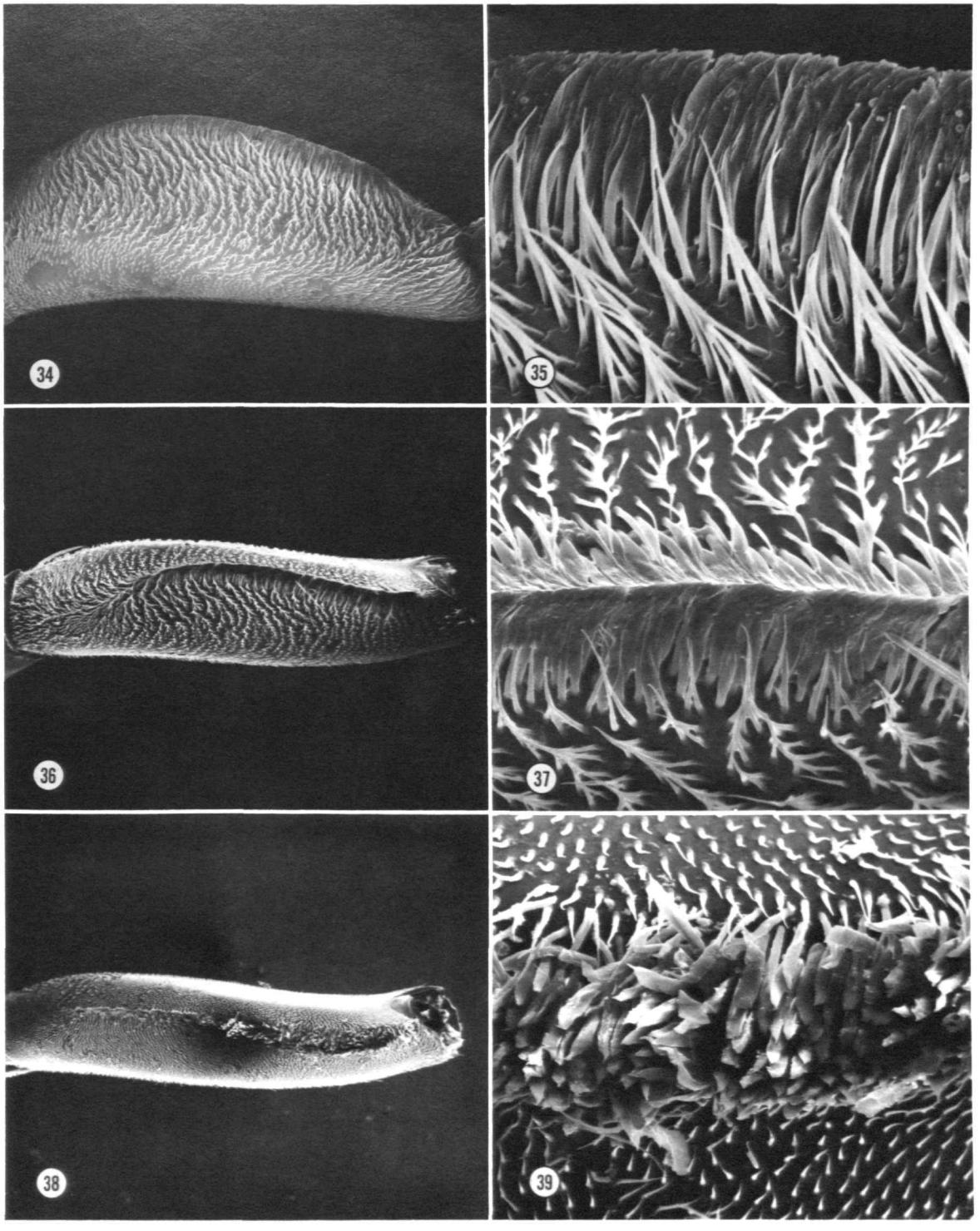
FIGURES 34–39.—Fore femur, female *Ammatomus alipes* (Bingham): 34, outer surface, posterior margin with brush of agglutinated setae at top (× 66); 35, same aspect, section of brush in profile on upper half of figure (× 536); 36, posterior aspect to show contour of brush (× 57); 37, section of brush from above showing setae agglutinated to form a sharp edge ("carina" of earlier authors) (× 400); 38, posterior aspect with setae on apical half of brush fluffed up by stroking with fine pin (× 57); 39, section of brush from above with setae of brush fluffed up (× 400).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