Supporting Information Figs S1 and S2, Table S1, Notes S1 (new damage type DT273, and literature cited)

The supportive information detailed below provide a variety of documented of piercing-and-sucking types damage from the literature that are compared to DT273 on *Metzgeriothallus sharoniae* from the Middle Devonian of New York state.

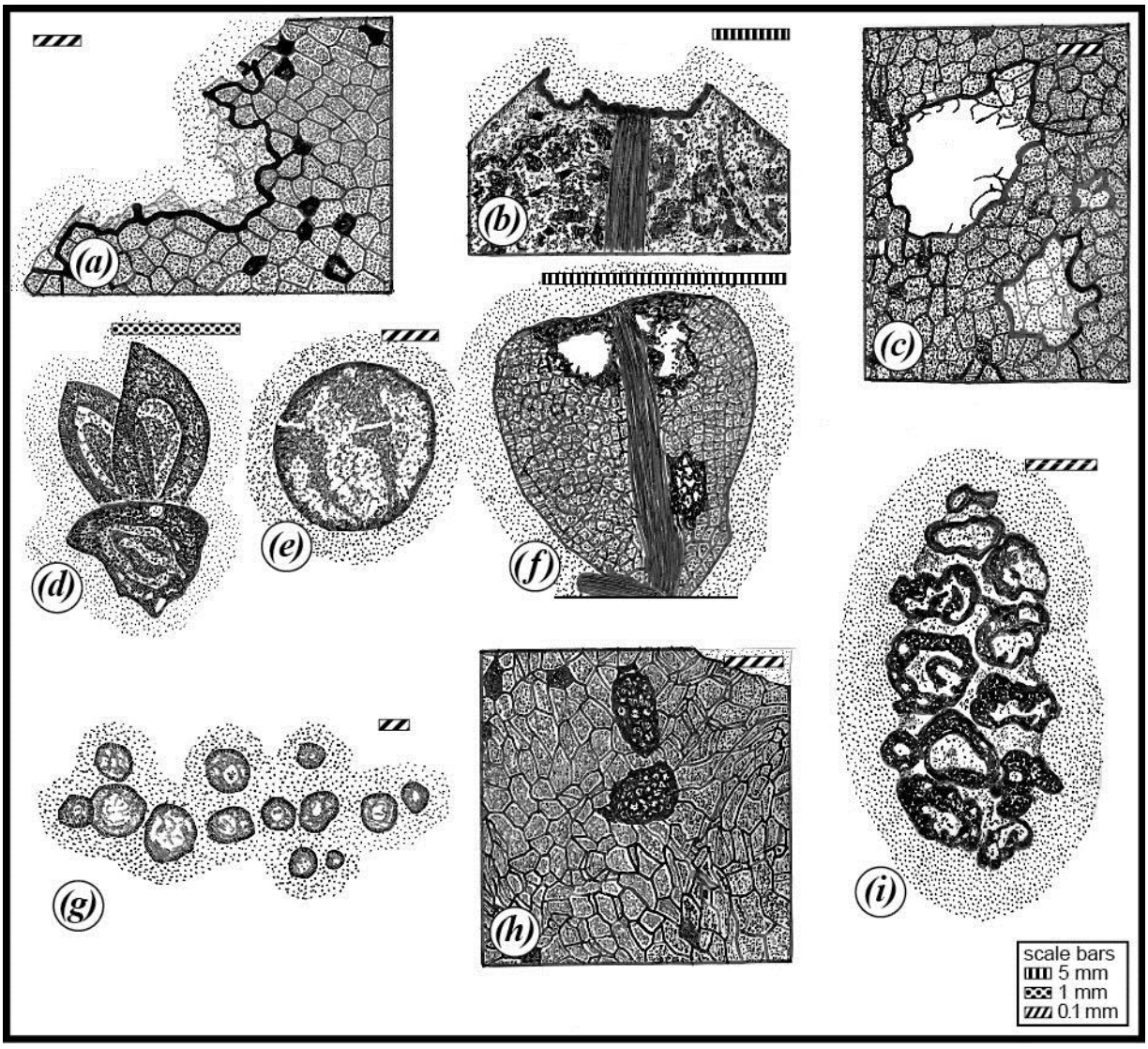

Fig. S1 The component community of arthropod herbivores on Middle Devonian *Metzgeriothallus sharonae*. The component functional feeding groups are (1), external foliage feeders, specifically margin feeders (**a**, **b**), hole feeders (**c**, **f**), and surface feeders (**c**, **f**); piercer and suckers (**d**, **e**, **g**); and (3), gallers (**h**, **i**).

Table S1 Comparison of various cross-sections of stylet marks indicating piercing and-sucking damage from late Paleozoic and modern plant hosts (see Fig. S2 below)

Piercing-and-sucking taxon; cited Fig. S2	*Age*	*Plant host*	*Target organ and tissues*	*Stylet puncture surface details and reference to figure*	*Sources*
(a) Unknown.	Early Devonian	Metzgeriales: *Metzgeriothallus sharonae*	Seed; mega-gametophytic tissues	Pyriform shaped punctures; *c*. 0.8 µm in longest dimension; with a distinctive outer rim and an inner cratered area, perhaps with an inner styletal penetration rim (**Fig. S2*a***).	this study
?Paleodictyoptera ***(b)*** Unknown	Middle Pennsylvanian	Medullosaceae: *Trigonocarpus* sp.	Seed; mega-gametophytic tissues	Circular punctures 0.4 µm in diameter traversing outer seed layers and accessing featureless inner megagametophytic tissues with a poorly developed outer rim (**Fig. S2*b***).	Jennings 1974; Scott & Taylor 1983
Diaphanopterodea ?Parelmoidae: ***(c)*** *Permuralia Maculate*	Late Pennsylvanian	Cordaitaceae: *Samaropsis* sp.	Seed; mega-gametophytic tissues	Circular punctures 0.6 mm in diameter traversing outer seed layers and accessing inner megagametophytic tissues; outer rim not evident and inner area consisting of featureless tissue (**Fig. S2*c***).	Sharov 1973; Zherikhin 2002
Thysanoptera Terebrantia Thripidae: ***(d)*** *Limothrips cerealium*	Modern	A variety of monocot plants	Foliar epidermis, palisade, & spongy parenchyma	Distinctive circular to broadly ellipsoidal marks *c*. 0.18 µm across; resulting from mouthcone adpression and abrasion to leaf surface characterized by a central figure-8 stylet puncture, flanked by a rim that hat extends into four ridges; forming an "X" like configuration. (**Fig. S2*d***).	Chisholm & Lewis 1984; Lewis 1991; Kirk 1997
(e) *Franklinella bispinosa*	Modern	Rutaceae: *Citrus sinensis*	Flower, epidermis, parenchyma	Mostly circular punctures *c*. 7 µm in diameter; occasionally with an acuminate notch from styletal penetration or withdrawal; an outer enveloping rim; an inner flange constituting the stylet sheath (**Fig. S2*e***).	Childers 1997
Hemiptera Sternorrhyncha Aleyrodidae: ***(f)*** *Bemisia argentifolii*	Modern	Malvaceae: *Gossypium hirsutum, Hibiscus rosasinensis*	Leaves; phloem	Short-ellipsoidal punctures *c*. 4 µm in longest dimension; with a very prominent outer rim, consisting of a prominent, mucilaginous stylet sheath surrounding a deep penetration hole (**Fig. S2*f***).	Freeman et al., 2001

Aphididae: ***(g)*** *Myzus persicae*	Modern	Solanaceae: *Nicotiana tabacum*	Leaves; phloem	Medially constricted intercellular punctures *c*. 3 µm long in maximum dimension; with an eccentrically placed stylet canal surrounded by a modest sheath (**Fig. S2*g***).	Lopez-Abella et al. 1988
Cercopidae: ***(h)*** *Haematoloma dorsatum*	Modern	Pinaceae: *Pinus nigra, Juniperus communis, Picea pungens*	Leaves; xylem, phloem	Broadly pyriform punctures *c*. 8 µm in longest dimension; acuminate at one end and rounded at the other; extensive development of inner stylet sheath with a torn flange; outermost a prominent reaction zone (**Fig. S2*h***).	Roversi et al. 1989
Cicadellidae: ***(i)*** *Ossiannilssonola callosa*	Modern	Sapindaceae: *Acer pseudoplatanus*	Leaves; mesophyll	Irregularly ovoidal punctures *c*. 10 µm in longest dimension; with multiple encircling reaction rims, the innermost a stylet sheath, the outermost a modest rim (**Fig. S2*i***).	Whittaker 1984
(j) *Aguriahana germari*	Modern	Pinaceae: *Pinus silvestris*	Leaves; mesophyll	Minuscule circular to slightly ovoidal, punctures *c*. 0.001 mm in diameter; with an inner stylet sheath consisting of a broken flange and a prominent, outer torus-like rim (**Fig. S2*j***).	Günthart & Günthart 1983
Psyllidae: ***(k)*** *Cacopsylla pyri*	Modern	Rosaceae: *Pyrus communis*	Leaf; xylem, phloem	Ovoidal to circular punctures *c*. 7 µm in maximum dimension; with a double outer rim, the inner one thicker; prominent, inner stylet sheath present (**Fig. S2*k***).	Civolani et al. 2011
Heteroptera Coreidae: ***(l)*** *Pseudotheraptus devastans*	Modern	Sterculiaceae: *Theobroma cacao*	Seed; endosperm	Ovoidal to long-ellipsoidal punctures *c*. 8 µm in greatest dimension; macerated inner tissue surrounded by unaffected surface tissue with or without a trace of an outermost rim; stylet sheath occasionally present (**Fig. S2*l***).	Lodos 1969
Pentatotomidae: ***(m)*** *Nezara viridula*	Modern	Proteaceae: *Macadamia integrifolia*	Seed; endosperm	Large, irregularly shaped punctures *c*. 2.3 µm in maximum dimension with an undulate, thick outer rim; interior area deeply invaginated; stylet sheath absent (**Fig. S2*m***).	Golden et al. 2006
Pyrrhocoridae ***(n)*** *Odontopus nigricornis*	Modern	Sterculiaceae: *Firmiana colorata*	Seed; endosperm	Short,-lenticular punctures *c*. 7 µm in maximum dimension; with a ragged to undulatory inner margin; stylet sheath not evident; surrounding reaction rim not evident (**Fig. S2*n***).	Rani & Madhavendra 1995
Acari					
Eriophyidae ***(o)*** *Aceria cladophthirus*	Modern	Solanaceae: *Solanum dulcamara*	Leaves; epidermis	Circular, disklike punctures *c*. 0.085µm in diameter; with a distinct outer rim and inner area with prominent, prong-like projections (**Fig. 2*o***).	Westphal 1983; Westphal & Manson 1996

Tetranychidae ***(p)*** *Tetranychus urticae*	Modern	Cucubitaceae: *Cucumis sativa*	Leaves; epidermis	Miniscule circular, intracellular punctures *c*. 3 μm in diameter; whose surfaces bear elongate surface distortions; and collapsed cellular contents; no evidence of sheath-like activity (**Fig. S2*p***).	Tanigoshi & Davis 1978; Park & Lee 2002

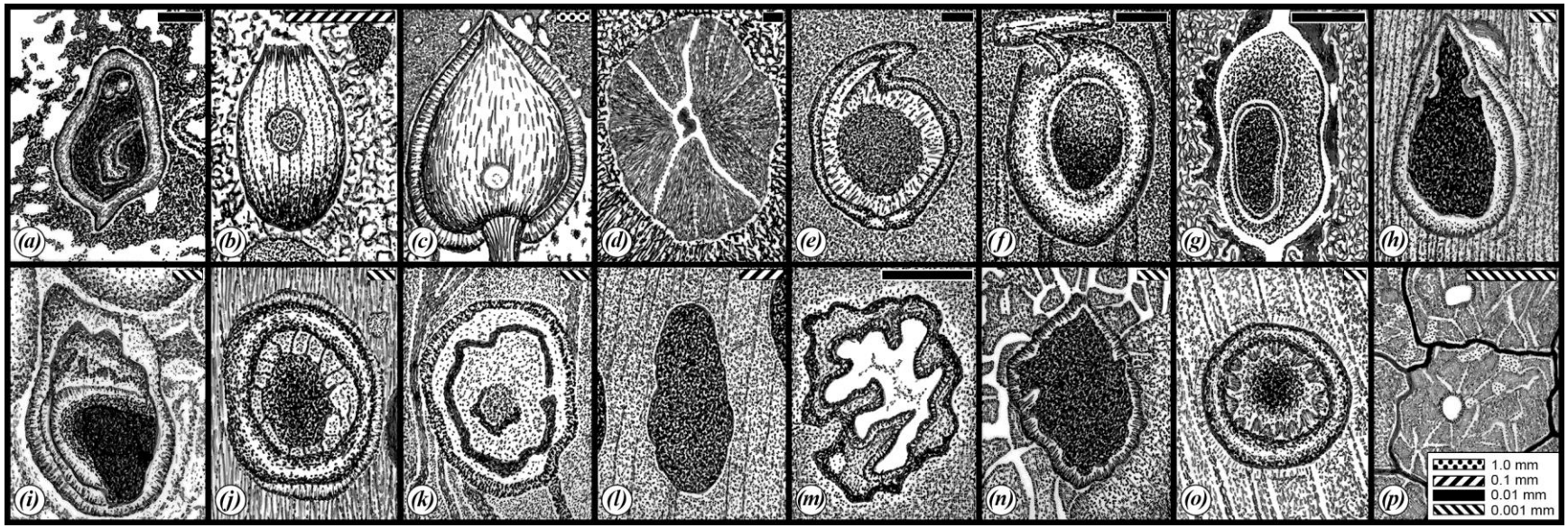

Fig. S2 A comparison of DT273: (**a**), on the liverwort *Metzgeriothallus sharonae* from the late Paleozoic of New York state, with published of late Paleozoic (**b**, **c**) and modern (**d**–**p**) piercing-and-sucking damage on a variety of land plants. Subfigure letter designations refer to the table above.

Notes S1 New Damage Type DT273

Description. Lenticular to elongate-ovoidal puncture parks with highly angulate, acute to acuminate ends 180 degrees from each other; central area cratered, with a margin paralleling the puncture border, often accompanied by ridged lineations along margin. Puncture marks clustered, consisting of 3 to 5 marks; puncture marks range from 1.3–2.0 mm in length and 0.6–0.9 mm in width.

Locality. Cairo Quarry, Greene County, New York; and Bates Hollow Quarry, Albany County, New York (VanAller Hernick *et al*., 2008).

Lithostratigraphy. Hamilton Group, Plattekill Formation,

Age. Givetian (late Middle Devonian)

Host. *Metzgeriothallus sharoniae* VanAller Hernick, Landing & Bartowski 2008 (VanAller Hernick *et al.,* 2008).

Host specificity. 3 (Labandeira *et al*., 2007)

Material. NYSM-18073 [Fig. 3(d) of main text]. Supplementary material: NYSM-18074 [Fig. 3(e) of main text].

Repository. Paleontology Collection of the New York State Museum, Albany, New York.

References to Fig. S2

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