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A new species of the plant bug genus *Phytocoris* from Nepal, representing the first record of the subgenus *Exophytocoris* for the Oriental Region (Hemiptera: Heteroptera: Miridae: Mirinae)

S. Pagola-Carte[1], T. Yasunaga[2], R.K. Duwal[3]

[1]Apdo. 70 P.K.; E-20150 Villabona (Gipuzkoa); E-mail: pagolaxpc@telefonica.net
[2]Research Associate; American Museum of Natural History; New York 10024; USA;
c/o Nameshi 2-33; Nagasaki 852-8061; Japan; E-mail: yasunagat.amnh@gmail.com
[3]Visiting Researcher; Agriculture & Agri-Food Canada Environmental Health;
Ottawa, Ontario; Canada K1A 0C6; E-mail: ramkeshariduwal@gmail.com

Abstract

A new species of the plant bug genus *Phytocoris* Fallén, 1814, *P.* (*E.*) *yetillus* **n. sp.**, is described from Kathmandu Valley, Nepal. This species evidently belongs to the subgenus *Exophytocoris* Wagner, 1961, representing the first record of the subgenus from the Oriental Region. Habitus images of live adults, host association, and SEM images of the external morphology and male and female genitalic structures are also provided for the new species. The *pinihalepensis*-group of species is redefined on the basis of a new interpretation of their vesicae.

Key words: Miridae, Mirini, *Phytocoris*, *Exophytocoris*, new species, morphology, SEM documentation, Nepal.

Resumen

***Una nueva especie de mírido de Nepal del género* Phytocoris*, primer representante del subgénero* Exophytocoris *en la Región Oriental* (*Hemiptera: Heteroptera: Miridae: Mirinae*)**

Se describe una nueva especie del género de míridos *Phytocoris* Fallén, 1814, *P.* (*E.*) *yetillus* **n. sp.**, del Valle de Kathmandu, en Nepal. La especie pertenece indudablemente al subgénero *Exophytocoris* Wagner, 1961, por lo que representa el primer registro del subgénero para la Región Oriental. Se aportan imágenes de individuos adultos vivos, información sobre su asociación con planta hospedadora, así como imágenes de MEB de la morfología externa y de las estructuras genitálicas masculinas y femeninas. Se redefine el grupo de especies de *pinihalepensis* sobre la base de una nueva interpretación de su vesica.

Palabras clave: Miridae, Mirini, *Phytocoris*, *Exophytocoris*, nueva especie, morfología, documentación MEB, Nepal.

Laburpena

***Miridoen* Phytocoris *generoko espezie berri bat Nepalgoa,* Exophytocoris *subgeneroko lehenengo ordezkaria Ekialdeko Eskualderako* (*Hemiptera: Heteroptera: Miridae: Mirinae*)**

Miridoen *Phytocoris* Fallén, 1814 generoko espezie berri bat, *P.* (*E.*) *yetillus* **n. sp.**, deskribatzen da Nepalgo Kathmandu Haranekoa. Espeziea *Exophytocoris* Wagner, 1961 subgeneroari dagokio zalantzarik gabe; horrenbestez, subgenero honen Ekialdeko Eskualdeko lehenengo aipua ordezkatzen du. Zenbait banako biziren argazkiak eta landare ostalariarekiko lotura erakusten dira, bai eta kanpo-morfologiaren eta arren eta emeen egitura genitalikoen EME irudiak eskaini ere. Azkenik, *pinihalepensis* espezie-taldea birdefinitzen da haien besikaren interpretazio berri bat dela eta.

Gako-hitzak: Miridae, Mirini, *Phytocoris*, *Exophytocoris*, espezie berria, morfologia, EME dokumentazioa, Nepal.

Introduction

Phytocoris Fallén, 1814 (Mirinae: Mirini) is the most speciose genus among the Heteroptera, with more than 700 described species known globally (Stonedahl, 1988; Schuh, 2002-2013; Yasunaga and Schwartz, 2015; Oh *et al.*, 2017). The majority of its members are known from the Holarctic Region, but a number of species traditionally placed in *Phytocoris* from the tropical or subtropical zones seem to be representatives of *Adelphocorisella* Miyamoto & Yasunaga, 1993 (Fig. 1f-g), *Creontiades* Distant, 1883, or other superficially similar genera (*cf.* Yasunaga and Schwartz, 2015; Yasunaga *et al.*, 2016). Particularly, some species of *Adelphocorisella* are externally very similar to *Exophytocoris*; however, the male and female genitalic structures are evidently different from each other (Figs. 2, 6), which implies that each genus was derived from an independent lineage. In the subtropical and tropical Oriental Region including southern slope of the Himalayas, genuine *Phytocoris* members appear to be restricted to conifer/deciduous mixed forests of Nepal (> 3,500 m alt.) and high mountains in Taiwan (Yasunaga and Duwal, 2016).

Eight subgenera other than nominotypical subgenus have been proposed for classification of the western Palaearctic congeners. Of these, the subgenus *Exophytocoris* Wagner, 1961 currently comprises 28 species, most of which have a north- or east-Mediterranean distribution, some others occur in the Middle East, a few ones are known from northern Africa and only one, namely *P.* (*E.*) *kansisrob* Linnavuori, 1975, from the Afrotropical Region (in addition to the Palaearctic catalogue (Aukema, 2018), see some outstanding or recent contributions: Lindberg, 1948; Linnavuori, 1974, 1994, 1999; Wagner, 1974; Wagner and Weber, 1978; Carapezza, 2016; Pagola-Carte, 2019; Pagola-Carte and Rieger, 2017, 2021; Çerçi *et al.*, 2021).

Nonetheless, our recent examination of specimens from Kathmandu Valley, Nepal, verified an undescribed species undoubtedly belonging to the subgenus *Exophytocoris*. We herein describe this unique taxon as new to science as well as document its detailed morphology and host plant association. The present finding also represents the first distributional record of an *Exophytocoris* member in the Oriental Region.

Material and methods

Field investigation was performed by T. Yasunaga and R.K. Duwal, as part of international partnership program between NMTU and JICA (Japan International Cooperation Agency) between 2005 and 2007. The type specimens are deposited in the following collections:

AMNH: American Museum of Natural History, New York, USA.

CNC: Canadian National Collection, Ottawa, Ontario, Canada.

NMTU: Natural History Museum, Department of Science, Tribhuvan University, Swayambhu, Kathmandu, Nepal.

SPCC: S. Pagola-Carte collection, Villabona, Spain.

TYCN: T. Yasunaga collection, Nagasaki, Japan.

Matrix code labels, which uniquely identify each specimen and are referred to as «unique specimen identifier» (USI), are attached to the holotype specimen. The USI codes [*e.g.*, AMNH_PBI 00123456] comprise an institution and project code (AMNH_PBI) and a unique number (00123456). These data were digitized on the Arthropod Easy Capture (formerly the Planetary Biodiversity Inventory) database maintained by the American Museum of Natural History, New York, USA (http://research.amnh.org/pbi/) and are also searchable (by species name) on «Heteroptera Species Pages» (http://research.amnh.org/pbi/heteropteraspeciespage/).

Scanning electron micrographs were taken with Hitachi Miniscope® (TM3030 and TM4000II); the genitalic structures were also observed with Nikon Eclipse Ci upright microscope, with a photophase unit. All measurements are given in millimeters; for most of the SEM images, scale bars are mostly shown in micrometers (μm). For taking genitalic SEM images, the following method was used: (1) Dissection and observation using a binocular stereoscopic microscope (Olympus SZX12); (2) The delicate, fragile organs were dipped and washed in 50–60% ethyl alcohol, placed on filter paper until dry, carefully attached to cards using water soluble wood glue; (3) They were finally placed in the SEM vacuum-chamber for examination (without vapor deposition of metals).

The synonymic lists for known taxa are omitted or only selected references are provided, as compre-

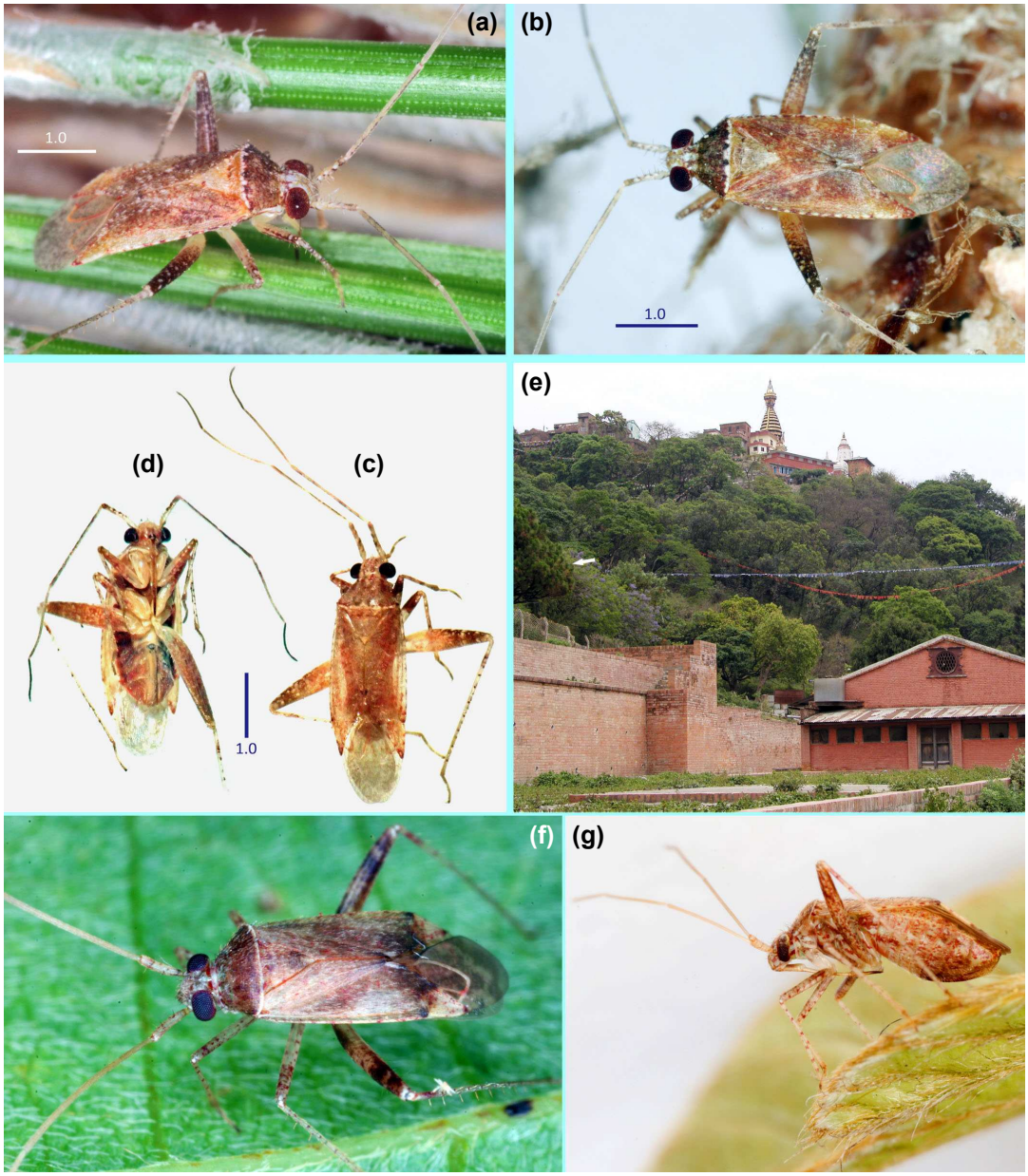

Figure 1. Habitus images and habitat of: (a)-(e) *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**; (f)-(g) *Adelphocorisella lespedezae*, Miyamoto & Yasunaga, 1993 / (a)-(b) Adult male, live individual; (c) Female, dry-preserved specimen, dorsal view; (d) Same, ventral view; (e) Habitat at the type locality (Swayambhu, Kathmandu, UNESCO World Heritage Site), with the host plant, *Pinus wallichiana* (arrowed); (f) Male, from Kabashima Island, Nagasaki, Japan; (g) Female, from Nagasaki City.

hensive catalogs are now available as printed volumes and/or online versions (Kerzhner and Josifov, 1999; Schuh, 1995; Schuh, 2002-2013; Aukema, 2018). Terminology of the genitalia mainly follows Davis (1955), Stonedahl (1988), Linnavuori (1994) and Yasunaga and Schwartz (2007, 2015).

Results

Phytocoris (*Exophytocoris*) *yetillus* n. sp.

(Figs. 1a-e, 2a-i, 3-5, 6a-l)

Type material:

HOLOTYPE: ♂, NEPAL: Bagmati Zone, Kathmandu, Swayambhu, NMTU garden, 27.714733, 85.287455, *Pinus wallichiana*, 12 May 2005, T. Yasunaga (NMTU) (AMNH_PBI 00380743).

PARATYPES: 9 ♂♂ + 5 ♀♀:

2 ♂♂ + 3 ♀♀: NEPAL: Same data as for holotype (AMNH, SPCC, TYCN).

1 ♂ + 1 ♀: NEPAL: Same data, except for date, 15 May 2005 (TYCN).

3 ♂♂: NEPAL: Same locality and plant, 5 Jun 2006, R.K. Duwal (CNC, NMTU).

2 ♂♂: Bagmati Zone, Dakshinkali, Pharping, 27.61, 85.26, 8 Oct 2005, R.K. Duwal (SPCC, TYCN).

1 ♀: Kathmandu, Gongabu-Samakhusi, N27°43'59.5", E85°18'49", 1,300 m alt., UV lighting, 30 May 2005, T. Yasunaga (SPCC).

1 ♂: Same data, except for date, 9 Jul 2004 (TYCN).

Diagnosis:

A typical member of the genus *Phytocoris* subgenus *Exophytocoris*, ascribable to the *pinihalepensis*-group («third group» *sensu* Linnavuori, 1994) and easily distinguishable from the other species by its unique combination of: (a) Size and shape: small to medium size (3.5–3.9 mm in ♂♂, 3.9–4.4 mm in ♀♀); elongate to slightly ovate, at most 3 times longer than wide, with pronotum noticeably narrowed anteriorly; (b) Colouration of antennae: segment II with a longitudinal, inner-lateroventral dark stripe; (c) Morphometric characters (specifically for comparison with other species in its same group): eyes big and laterally protruding without reducing vertex to minimum, hence an ocular index not very low (about 0.9 in ♂♂ and 1.5 in ♀♀); antennal segments I short and II medium, resulting in a comparatively low ratio segment I / diatone (about 0.7 in ♂♂ and 0.8 in ♀♀) and a medium to high ratio segment II / basal width of pronotum (about 1.4–1.5); (d) Male genitalia: pygophore with a stout process at base of left paramere and a smaller, conical process at base of right paramere; left paramere with moderately widened apex of hypophysis, bearing several small notches, and sensory lobe slightly to moderately protruding; vesica completely different to that of all other known species, with a rod-like sclerotized basal process (SBP) adjacent to secondary gonopore, without lobal sclerites (LS) or dentate longitudinal areas (DLA) near secondary gonopore, but with both major membranous lobes provided with longitudinally arranged rows of teeth (LRT), those rows being highly noteworthy in number and length.

Description:

Macropterous males (Fig. 1a-b) and females (Fig. 1c-d). Moderate-sized in the subgenus, with total length = 3.5–3.9 mm (♂♂), 3.9–4.4 mm (♀♀). Elongate to slightly ovate, slender. Body generally stramineous or pale brown, speckled with rusty red (Fig. 1a-b); dorsal surface weakly shining, rather matte, mottled with pale spots or maculae, impunctate, with sparsely distributed, simple, brown, semierect setae and uniformly distributed, sericeous, reclining setae (Fig. 2b, d).

Head clearly wider than high in front view and higher than long in lateral view; noticeably wide in comparison to pronotum width (4/5 in ♂♂, 3/4 in ♀♀); including neck pale brown, speckled with irregular white maculae and reddish striae; eyes big, globose and distinctly protruding laterally; frons and vertex mostly cream with variously shaped reddish and orange maculae; clypeus orange, its extreme apex dark brown; mandibular plates with a transversal red stripe; maxillary plates markedly protruding and orange; bucculae pale with a basal, longitudinal dark stripe. Antenna pale grayish brown; segment I speckled with small, whitish and dark spots, and bearing a variable number (up to 16) of pale to dark, long, erect setae; segment II with a longitudinal, inner-lateroventral dark stripe, always quite distinct in ventral view and more or less visible dorsally as narrow stripes that are partly interrupted; segment III with basal and apical pale rings of slightly >5% and slightly <5% of segment length, respectively. Labium shiny reddish brown, reaching but not exceeding apex of mesocoxa; segment IV somewhat darker.

Pronotum subtrapezoidal and short, approximately two times wider than long, and noticeably narrowed anteriorly, with posterior margin convex and lateral margins very slightly arcuate; more or less darkened, with creamy yellow posterior margin and a submarginal dark brown stripe formed by 6-10 spots more or less coalescent; collar shorter (3/4 to 3/5 ×) than width of antennal segment I, and partly whitish; pronotal calli not very distinct; scutellum grayish, with

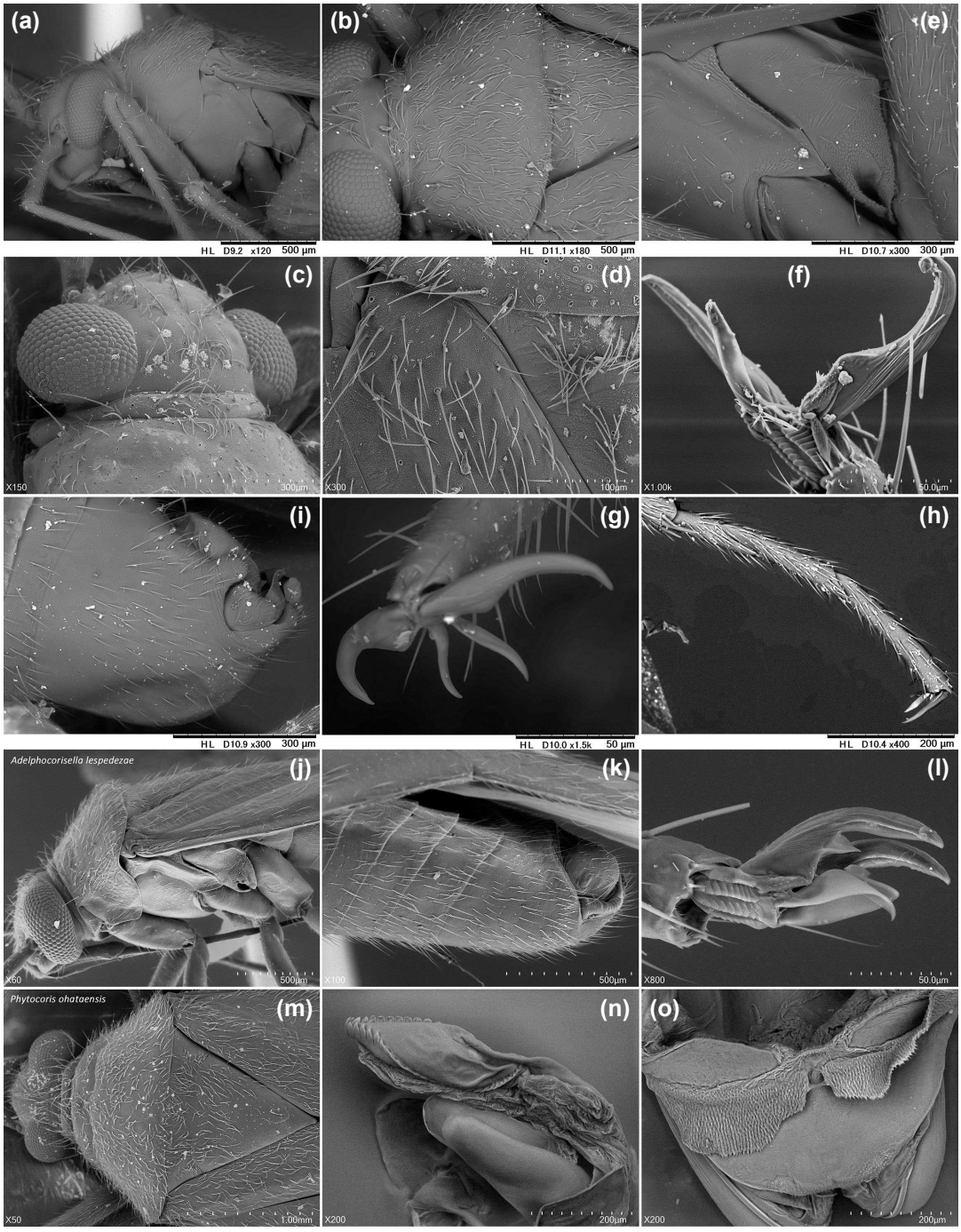

Figure 2. Scanning electron micrographs for: (a)-(i) *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**; (j)-(l) *Adephocorisella lespedezae* Miyamoto & Yasunaga, 1993; (m)-(o) *Phytocoris* (*s. str.*) *ohataensis* Linnavuori, 1963 / (a), (j) Head and thorax, left lateral view; (b) Same, dorsal view; (c) Head and anterior pronotum, dorsal view; (d) Dorsal vestiture pattern on anterior hemelytron and scutellum; (e) Thoracic pleurites, left lateral view; (f)-(g), (l) Pretarsal structure of metaleg; (h) Tarsomeres of metaleg; (i), (k) Pygophore, left lateral view; (m) Anterior body, dorsal view; (n) Vesica; (o) Posterior wall.

whitish apex usually preceded by a pair of lateral reddish spots; pleura pale brown, suffused with red dorsally; metathoracic scent efferent system relatively narrow (Fig. 2e).

Hemelytron widely rusty reddish brown, weakly shining, partly mottled with pale spots; exocorium (embolium) with creamy small spots along lateral margin; cuneus pale brown, with reddish inner margin and apex; membrane pale smoky brown, with reddish veins.

Legs reddish brown; all femora and bases of all tibiae studded with pale, small spots; base of each femur more or less pale; tibiae with pale brown spines and brown small spots at bases of spines, without distinct dark rings except for a subbasal one in metatibiae of some specimens; metatarsomere III slightly longer than II (Fig. 2h); pretarsal structures as in Fig. 2f-g; parempodia slender, lanceolate; pulvilli weakly swollen.

Abdomen rusty red, partly pale brown.

Male genitalia (Figs. 2i, 3a-d, 4-5, 6a-f): Pygophore with stout process at base of left paramere (Figs. 2i, 4a, 6a, d) and smaller, conical process at base of right paramere (Fig. 4a); provided with rather long but scarce setae. Left paramere (Figs. 3a-b, 4c, 6b) edentate, with moderately widened apex of hypophysis bearing several small notches and slightly to moderately protruding sensory lobe with setae. Right paramere (Figs. 3c, 4b, 6c) small, bulbous and with a subbasal group of setae. Vesica (Figs. 3d, 5, 6e-f) with membranous sac mainly bilobed, both lobes provided with longitudinally arranged rows of teeth (LRT) of diverse length, longer on the concave side of vesica, and extending from its apex in a subparallel fashion, some of them almost reaching the secondary gonopore; with a unique sclerotized basal process (SBP) or spiculum of rod-like shape with 3-4 points, which is adjacent to secondary gonopore and is the most sclerotized part of the vesica; without other sclerotized structures or regions such as lobal sclerites (LS) or dentate longitudinal areas (DLA) near secondary gonopore; secondary gonopore (SG) thick-rimmed, circular; apical margin of phallotheca smooth.

Female genitalia (Figs. 3e-g, 6g-l): Sclerotized rings tiny, ovoid, situated on lateral margins of genital chamber; dorsal structure densely provided with stiff spines; interramal lobe densely covered with sharp, apically branched spinules.

Measurements and ratios:

See Table 1 for measurements (in mm).

Ratios: Total length / basal width of pronotum = 3.47 (3.33–3.56) (♂♂), 3.64 (3.56–3.78) (♀♀). Total length / maximum width = 2.86 (2.78–2.95) (♂♂), 2.93 (2.78–3.01) (♀♀). Ocular index = 0.92 (0.90–0.96) (♂♂), 1.47 (1.44–1.52) (♀♀). Segment I / diatone = 0.68 (0.63–0.72) (♂♂), 0.79 (0.73–0.84) (♀♀). Segment II / diatone = 1.85 (1.74–1.99) (♂♂), 2.02 (1.94–2.14) (♀♀). Segment II / basal width of pronotum = 1.45 (1.39–1.50) (♂♂), 1.48 (1.43–1.56) (♀♀). Segments II / I = 2.73 (2.65–2.78) (♂♂), 2.58 (2.32–2.93) (♀♀). Segments II / III+IV = 0.75–0.91. Relative proportions of metatarsomeres I–II–III = 8–14–15.

	Body L	Head W	VTX W	PRN W	HEM W	Antennomere L I	Antennomere L II	Antennomere L III	Antennomere L IV	LBM L	Metaleg L FM	Metaleg L TB
Males	3.85	0.87	0.27	1.08	1.37	0.60	1.59	1.16	0.72	1.23	1.80	2.45
	3.80	0.86	0.27	1.08	1.29	0.54	1.50	1.20	0.80	1.23	1.65	2.43
	3.50	0.83	0.26	1.05	1.26	0.56	1.53	1.11	0.75	1.20	1.70	2.34
	3.82	0.83	0.27	1.10	1.32	0.60	1.65	1.17	0.65	1.23	1.76	2.49
Females	3.97	0.81	0.35	1.11	1.32	0.59	1.73	1.28	0.83	1.34	1.95	2.67
	4.39	0.86	0.36	1.16	1.46	0.68	1.70	1.37	0.75	1.35	1.98	2.78
	4.17	0.86	0.36	1.17	1.50	0.72	1.67	1.31	0.77	1.37	2.10	2.96

TABLE 1. Measurements for *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.** (Abbreviations: FM = femur; HEM = hemelytra; L = length; LBM = labium; PRN = pronotum; TB = tibia; VTX = vertex (interocular space); W = width).

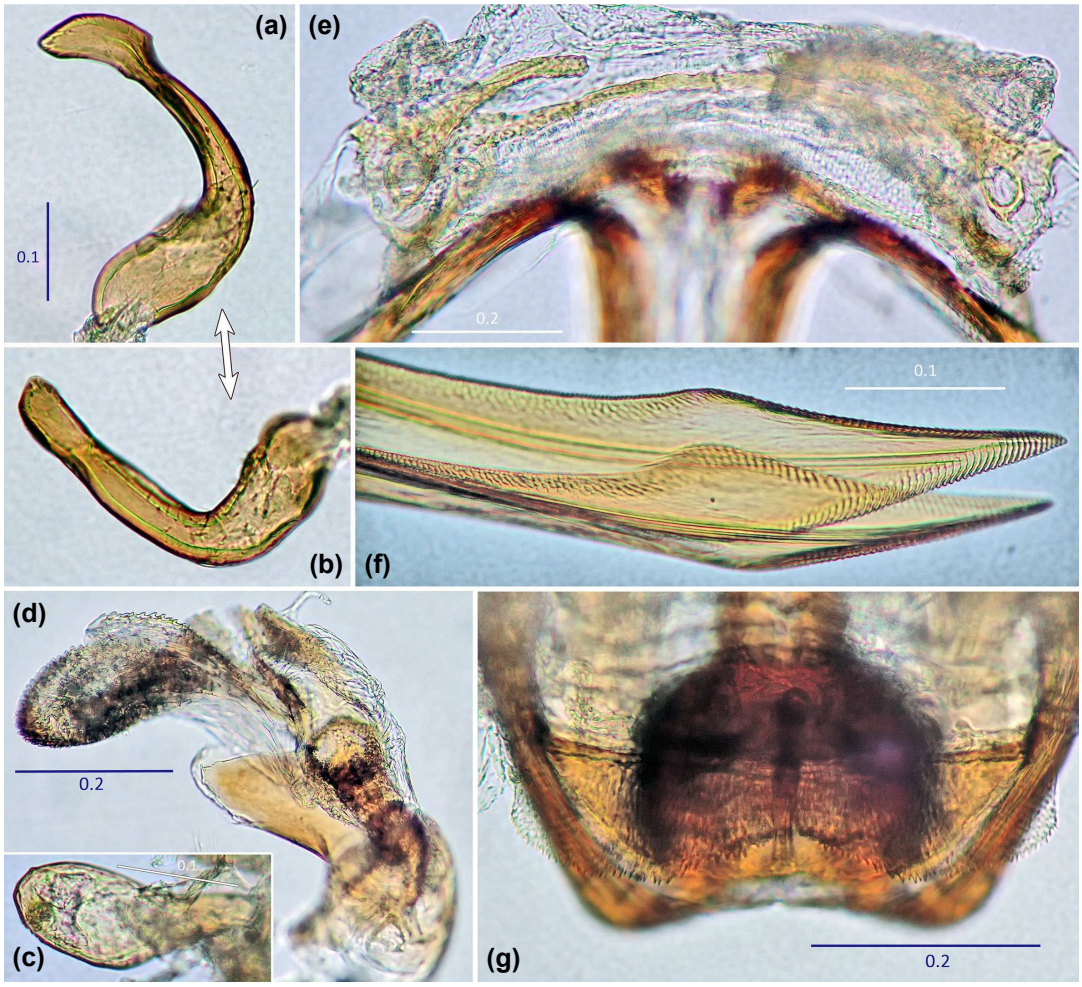

FIGURE 3. *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**: (a)-(d) Male genitalia; (e)-(g) Female genitalia / (a)-(b) Left paramere; (c) Right paramere; (d) Vesica; (e) Genital chamber, with sclerotized rings, ventral view; (f) Ovipositor (gonapophysis I); (g) Posterior wall.

Etymology:

Named for Yeti combined with a diminutive suffix (*-illus*); Yeti is believed by some people to be a humanoid creature living in the Himalayas and deeply covered with hairs; our new species is also hairy and unique Himalayan inhabitant; an adjective.

Biology:

Most of the available specimens were found on *Pinus wallichiana* A.B. Jacks. (Pinaceae). A few individuals were collected by UV lighting method.

Discussion

The new species is placed in the subgenus *Exophytocoris* due to the combination of characters usually adduced (Wagner, 1974; Rieger, 1989; Linnavuori, 1999; Carapezza, 2016): hemelytra not ornamented with regular dense orangish or red mottling, right paramere entirely sclerotized, left paramere edentate, antennal segment I shorter than diatone, antennal segment III dark brown with pale base, head in lateral view higher than long and frons moderately convex, with a shallow depression between it and the base of

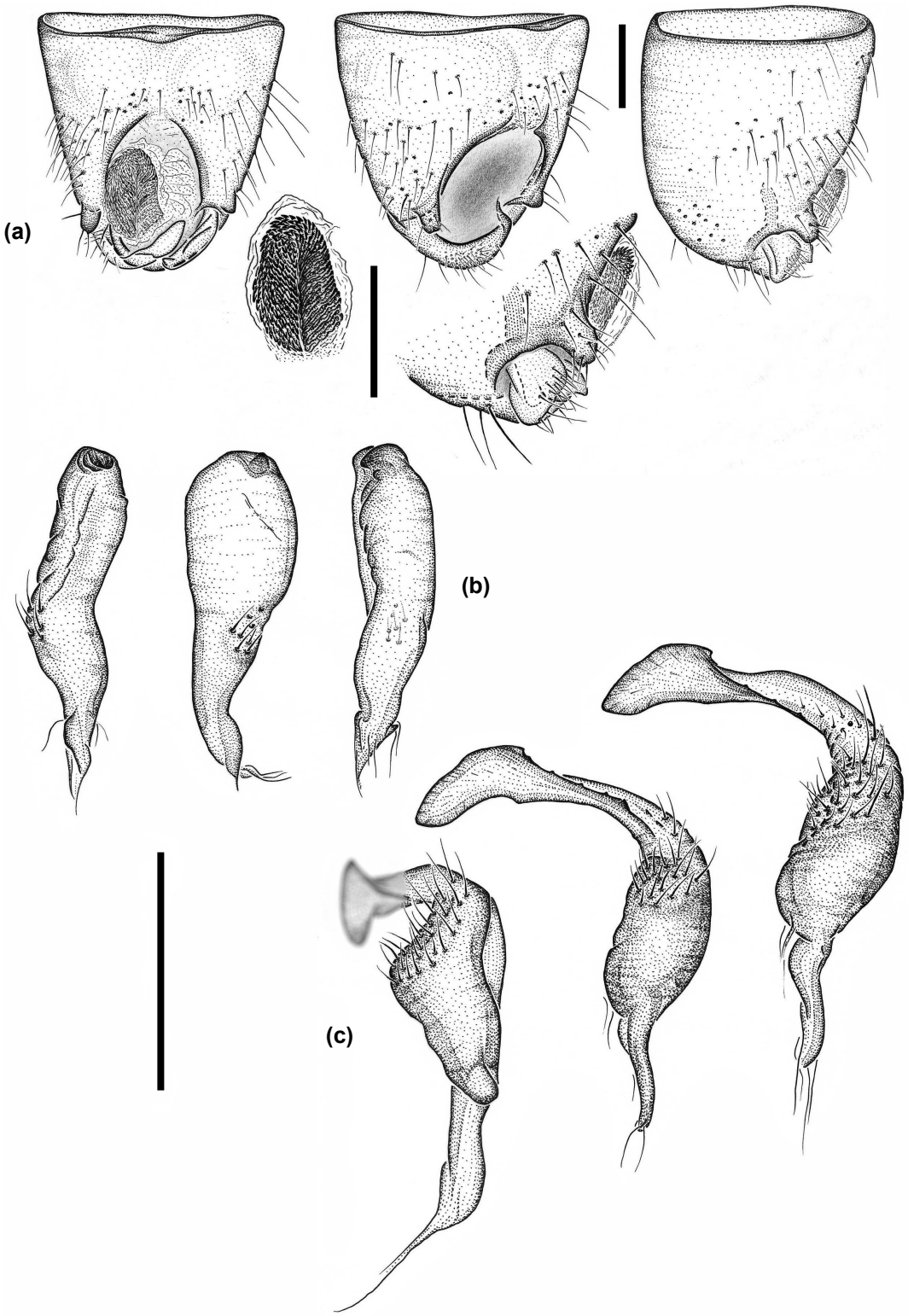

FIGURE 4. *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**, male genitalia: (a) Pygophore in different views, parameres kept or removed, and showing magnification of some details; (b) Right paramere, different views; (c) Left paramere, different views (Scale bars = 0.2 mm).

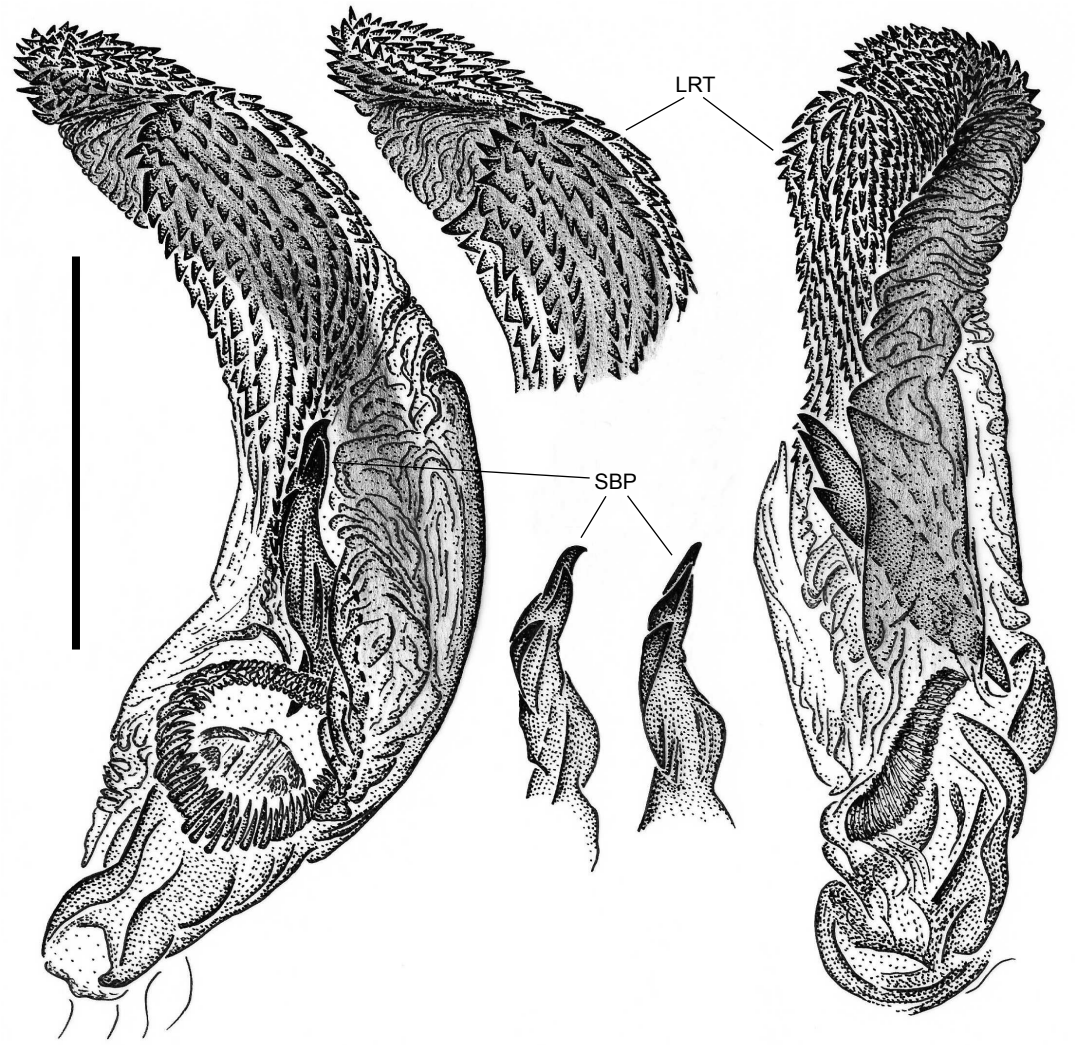

Figure 5. *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**, male genitalia: Vesica (phallotheca removed) in different views, showing detail of the longitudinally arranged rows of teeth (LRT) and the sclerotized basal process (SBP), also in different views (Scale bar = 0.2 mm).

clypeus. The small notches observed on the hypophysis of the left paramere (see Fig. 4c) are assumed not to correspond to the character «left paramere dentate» typical of subgenus *Compsocerocoris* Reuter, 1876. In any case, it should be recalled that within *Exophytocoris* there are at least two species with dentate left paramere, namely *P.* (*E.*) *buxi* Ribaut, 1928 and *P.* (*E.*) *pseudobscuratus* Rieger & Pagola-Carte, 2009.

P. (*E.*) *yetillus* **n. sp.** also exhibits the typical facies of the subgenus and is therefore similar to most species of *Exophytocoris* in having: (a) a small size (< 6 mm); (b) reddish or reddish brown patterns; (c) coniferous host plant (the only exceptions being *P.* (*E.*) *buxi* Ribaut, 1928 on *Buxus sempervirens*, *P.* (*E.*) *oleae* Linnavuori, 1962 on *Olea europaea*, *P.* (*E.*) *loralis* Wagner, 1976 on *Juglans regia* and *P.* (*E.*) *koronis* Linnavuori, 1992 on *Acer microphyllum*).

Furthermore, members of *Exophytocoris* can be gathered into a few groups of species according to the structure of their vesica. Even when the whole subgenus is likely to constitute a monophyletic taxon

(but notice that separation between subgenera *Exophytocoris* and *Compsocerocoris* might be controversial), the aforementioned groups can be suspected to better reflect strong phylogenetic relationships (see comments by Pagola-Carte, 2019: p. 270, and references therein included). It was Linnavuori (1994) who first recognized such subdivision of the subgenus, and accordingly defined three main groups of species on the basis of the shape of the sclerotized basal process (SBP); with updated information and terminology, as follows:

***parvulus*-group (= «group 1»):**

- SBP: blade-like and marginally dentate (= comb-like).
- 16 known spp., distribution = whole area of distribution of *Exophytocoris*.
- two subgroups of species proposed or suggested: *parvulus*-subgroup, including *P.* (*E.*) *parvulus* Reuter, 1880, *P.* (*E.*) *fieberi* Bolívar, 1881 and *P.* (*E.*) *diversitatis* Pagola-Carte & Rieger, 2017 (see: Pagola-Carte, 2010; Pagola-Carte and Rieger, 2017); *buxi*-subgroup, including *P.* (*E.*) *buxi* and *P.* (*E.*) *pseudobscuratus* (see: Rieger and Pagola-Carte, 2009; Pagola-Carte, 2010).
- exceptions to coniferous host-plants: *P.* (*E.*) *buxi* and *P.* (*E.*) *oleae*.

***minor*-group (= «group 2»):**

- SBP: trough-shaped with both margins dentate.
- 2 known spp., distribution: north-Mediterranean.
- exception to coniferous host-plants: *P.* (*E.*) *loralis*.

***pinihalepensis*-group (= «group 3»):**

- SBP: formed of several marginally dentate lamellae (MDL).
- 11 known spp. (including the new one), distribution restricted to the east-Mediterranean (now extended to Nepal).
- one subgroup of species proposed or suggested: *pinihalepensis*-subgroup, including *P.* (*E.*) *pinihalepensis* Lindberg, 1948, *P.* (*E.*) *carapezzai* Çerçi, Koçak & Tezcan, 2019, *P.* (*E.*) *fosteri* Pagola-Carte & Rieger, 2021 and *P.* (*E.*) *scituloides* Lindberg, 1948 (see: Pagola-Carte and Rieger, 2021).
- exceptions to coniferous host-plants: *P.* (*E.*) *koronis*.

Due to its remarkably distinctive vesica, *P.* (*E.*) *yetillus* **n. sp.** cannot be satisfactorily placed in any of those three groups as currently defined. However, it is undoubtedly closer to the *pinihalepensis*-group than to any of the other two groups. In our opinion, the new species from Nepal is ascribable not only to *Exophytocoris* (on the basis of morphological features mentioned at the beginning of this Discussion), but also to such «third group» of species, in the same way as two other peculiar species, namely *P.* (*E.*) *raunolinnavuorii* Carapezza, 2016, from Lebanon, which was suggested to form a group of its own (Carapezza, 2016), and *P.* (*E.*) *parvuloides* Wagner, 1961, from Crete, which could also be seen as a questionable member according to its dissimilar vesica (unpubl. obs.; and see: Rieger, 1995: fig. 3 [as *P.* (*P.*) *malickyi*]). In the authors' view, once the unifying characters of the vesica are redefined, all these three species may plainly represent interesting examples of variability within the *pinihalepensis*-group. Let us show why.

Concerning *P.* (*E.*) *yetillus* **n. sp.**, the vesica contains a sclerotized appendage clearly referable to as «sclerotized basal process» (SBP) of rod-like shape and adjacent to the secondary gonopore, instead of a more apically located SBP consisting of marginally dentate lamellae (MDL), which is typical (by definition) of this group of species (see discussion on the terms «sclerotized process» and «basal process» in Stonedahl, 1988: p. 13). On the other hand, the longitudinally arranged rows of teeth (LRT, as we have herein abbreviated) on the surface of the membranous lobes seem to be homologous to some types of dentate longitudinal areas (DLA) or, even more clearly, to the typical marginally dentate lamellae (MDL) (see a likely intermediate condition in a teneral specimen of *P.* (*E.*) *fosteri* in Pagola-Carte and Rieger, 2021: fig. 7). As to *P.* (*E.*) *raunolinnavuorii*, in its vesica can be observed: a lobal sclerite (LS) and DLA near secondary gonopore but, instead of the typical MDL, there is a spindle-shaped sclerotized process formed by several imbricated apically dentate strips (Carapezza, 2016). Thirdly in *P.* (*E.*) *parvuloides*, its vesica shows DLA near secondary gonopore, but lacks LS, and at least one lobe of the membranous sac is provided with rows of teeth that cannot be accurately described as «SBP consisting of MDL» but rather as LRT, running from the apex to almost the secondary gonopore (unpubl. obs.; and see: Rieger, 1995: fig. 3 [as *P.* (*P.*) *malickyi*]) approximately as in *P.* (*E.*) *yetillus* **n. sp.**

We hypothesize that all these external sclerotizations of the vesical lobes might represent an evolutive trend in the *pinihalepensis*-group, with several degrees of homology among the various structures. Moreover, the marginally dentate lamellae (MDL) *sensu* Linnavuori (1994) are probably not homologous to true sclerotized basal processes (SBP), so that «SBP consisting of MDL» could make no sense. Although a research on these matters is out of the scope and aim of the present taxonomic description, our observations and interpretations allow us to propose now a unifying view of the vesica of all members included within the *pinihalepensis*-group. As follows: (1) Membranous sac mainly bilobed;

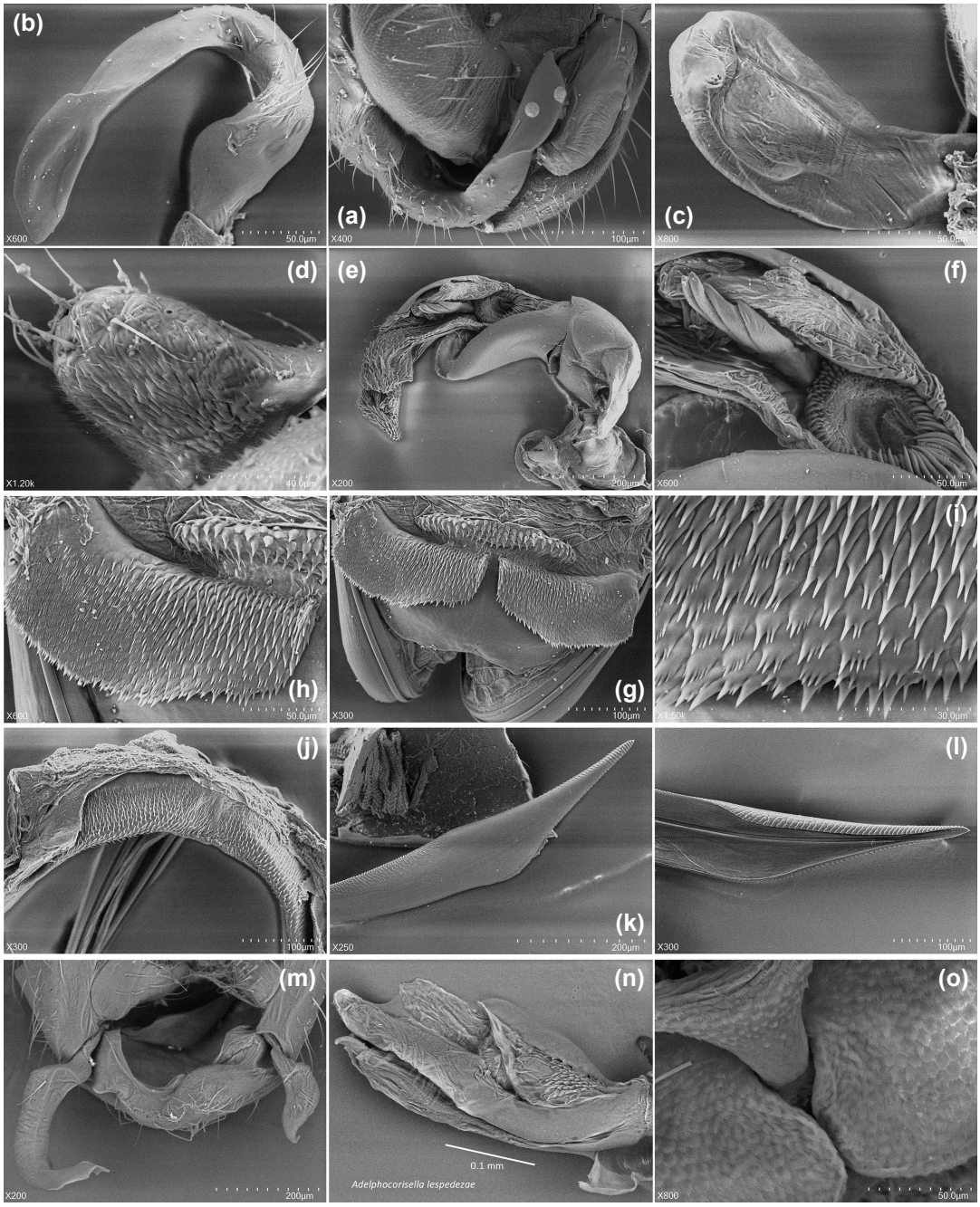

Figure 6. Scanning electron micrographs for: (a)-(l) *Phytocoris* (*Exophytocoris*) *yetillus* **n. sp.**; (m)-(n) *Adelphocorisella lespedezae* Miyamoto & Yasunaga, 1993; (o) *Adelphocorisella insulana* Miyamoto & Yasunaga, 1993 / (a)-(f), (m)-(n) Male genitalia; (g)-(l), (o) Female genitalia / (a), (m) Genital segment with parameres, dorsal view; (b) Left paramere; (c) Right paramere; (d) Pygophoral process; (e), (f), (n) Vesica; (g) Posterior wall; (h), (o) Dorsal structure and interramal lobe; (i) Microstructures on interramal lobe; (j) Genital chamber, dorsal view; (k) Ovipositor (gonapophysis I), outer side; (l) Same, inner side.

(2) Presence of MDL, DLA and/or LRT as part of a same trend towards external sclerotizing of the membranous lobal surfaces by means of teeth and similar structures; (3) Possible development of more robust sclerotized structures not only concerning external surfaces of the lobes but also forming robust rod-like or spine-like processes, sclerites or spiculae such as the basal one in *P.* (*E.*) *yetillus* **n. sp.** and the apical ones in *P.* (*E.*) *carapezzai*, *P.* (*E.*) *fosteri*, *P.* (*E.*) *pluotae*, *P.* (*E.*) *raunolinnavuori* and *P.* (*E.*) *scituloides*.

Setting aside the genitalic characters, the new species can also be separated from the other members of the *pinihalepensis*-group by external morphology, its unique combination of characters having been summarized in the Diagnosis and more thoroughly detailed below by the inverse way of showing the most noticeable similarities with one or another species.

By its general colouration, *P.* (*E.*) *yetillus* **n. sp.** is rather similar to *P.* (*E.*) *carapezzai*, *P.* (*E.*) *fosteri*, *P.* (*E.*) *pinihalepensis* and *P.* (*E.*) *scituloides*. Among them, *P.* (*E.*) *fosteri* and *P.* (*E.*) *scituloides* also share with the new species the peculiar dark stripe on segment II of antennae.

Concerning morphometry, and taking into account the most reliable or useful measures and ratios, *P.* (*E.*) *yetillus* **n. sp.** is most similar to *P.* (*E.*) *parvuloides*, since the latter appears in every of the following lists of characters: (a) Total body length: similar to *P.* (*E.*) *fosteri*, *P.* (*E.*) *parvuloides*, *P.* (*E.*) *pinihalepensis*, *P.* (*E.*) *pluotae* and *P.* (*E.*) *zenobia*; (b) Ocular index: similar to *P.* (*E.*) *matocqi*, *P.* (*E.*) *parvuloides*, *P.* (*E.*) *pinihalepensis* and *P.* (*E.*) *pluotae*; (c) Segment I / diatone: similar to *P.* (*E.*) *fosteri*, *P.* (*E.*) *parvuloides* and *P.* (*E.*) *pluotae*; (d) Segment II / basal width of pronotum: similar to *P.* (*E.*) *koronis*, *P.* (*E.*) *matocqi*, *P.* (*E.*) *parvuloides* and *P.* (*E.*) *raunolinnavuori*; (e) Segments II/I: similar to *P.* (*E.*) *fosteri*, *P.* (*E.*) *parvuloides*, *P.* (*E.*) *pinihalepensis* and *P.* (*E.*) *raunolinnavuori*.

As shown, *P.* (*E.*) *yetillus* **n. sp.** should be considered a highly interesting species of *Phytocoris* (*Exophytocoris*). On the one hand, it clearly belongs to that subgenus, thus representing its first record in the Oriental Region. The only species of *Phytocoris* hitherto known from Nepal, namely *Phytocoris sagarmathanus* Yasunaga & Duwal, 2016, is likely to belong (or to be close) to *Phytocoris s. str.* according to the usual west-Palaearctic classification. Similarly, most of the recently described species from China, Japan and Korea (see: Zheng *et al.*, 2004; Yasunaga and Schwartz, 2015; Oh *et al.*, 2017) could not be ascribed to *P.* (*Exophytocoris*). It can be suspected, however, that further Asian species of this subgenus still await discovery and description, at least in coniferous forests between the east-Mediterranean and the Himalayas.

On the other hand, the new species has allowed redefining the *pinihalepensis*-group of subgenus *Exophytocoris*. In fact, beyond the strong similarities in external morphology, it is more and more obvious the existence of a high variability in their vesicae (male genitalia), and the peculiar structure of the vesica of *P.* (*E.*) *yetillus* **n. sp.** has been revealed as crucial for a new and unifying reinterpretation of this structure in this group of species.

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