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A new species of *Serangium* Blackburn (Coleoptera: Coccinellidae), with a key to species, from India

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ABSTRACT: *Serangium serratum* sp. n. (Coleoptera: Coccinellidae: Sticholotidinae), predatory on *Heteropsylla cubana* Crawford (Homoptera: Psyllidae) is described, along with a key to Indian species.

KEY WORDS: *Serangium,* new species, *Heteropsylla cubana*, key to species

Coccinellid beetles belonging to the tribe Serangiini (Coccinellidae: Sticholotidinae) have a narrow host range, mostly restricted to whiteflies (Homoptera: Aleyrodidae). There are currently seven genera placed in this tribe, namely, *Serangium* Blackburn (1889), *Catana* Chapin (1940), *Serangiella* Chapin (1940), *Microserangium* Miyatake (1961a), *Catanella* Miyatake (1961b), *Delphastus* Casey (1899) and *Microscymnus* Champion (1913) (Chazeau *et al.*, 1990). All these genera are of Oriental origin, except the last two, which are found in the New World. Miyatake (1961b) provided a key to the Oriental Serangiine genera.

From India, only three species, namely, *parcesetosum* Sicard (1929) and *montazerii* Fürsch (1995) under *Serangium* and *chapini* Kapur (1954) under *Catana* have been recorded so far. Woglum (1913) and subsequently, Clausen (1934) and Pruthi and Mani (1945) recorded *S. flavescens* (Motschulsky, 1866) as a predator of *Dialeurodes citri* (Ashmead) in India. These records are erroneous and Korschefsky (1931) also gave its distribution as Sri Lanka in his catalogue. A new species of *Serangium* predatory on the psyllid, *Heteropsylla cubana* Crawford (Homoptera: Psyllidae), a serious pest of subabul [*Leucaena leucocephala* (Lam.) de Wit] from Karnataka, India, is described here.

***Serangium serratum* Poorani, sp. n.**

(Figs. 1-11)

Length: 1.60-1.80 mm; width: 1.30-1.50 mm. Body (Fig. 1) short, subhemispherical, strongly convex, widest at or slightly beyond middle of elytra. Dorsal side dark reddish brown, without any markings; scutellum and sometimes pronotum much darker than rest of body; ventral side, mouth parts and legs yellowish brown and paler; mandibles and tarsal claws dark brown, elytral epipleura yellowish brown with a dark brown margin.

Head (Fig. 2) transverse; eyes large, coarsely faceted and widely separated; frons with coarse punctations, separated by 3-5 diameters, sparser towards apex, with semi-erect hairs, emarginate around antennal insertion and prolonged anteriorly; clypeus truncate with anterolateral angles slightly excised. Antennae (Fig. 3) nine-segmented; terminal segment largest, expanded to form a pyriform club. Mouth parts with apically bifid mandibles; maxillary palpi (Fig. 5) with elongate oval terminal segment.

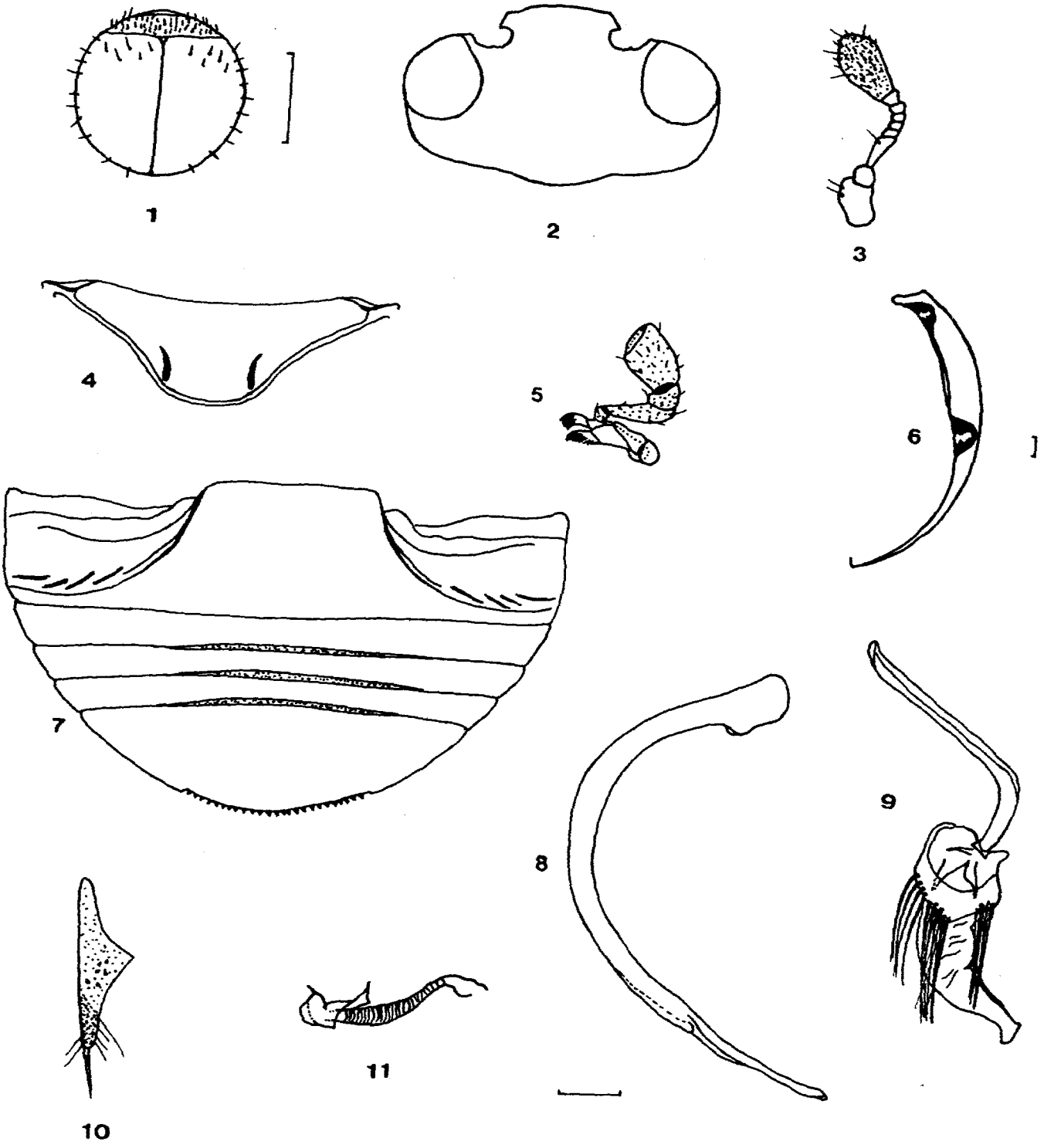
Pronotum with coarse punctations, separated by 2-5 diameters, more widely spaced on sides, bare along midline; densely pubescent; lateral and anterior margination fine. Scutellum small, triangular, longer than broad with few punctations. Elytra shiny, finely marginated; with rows of round dots, darker than ground colour, on either side of suture and lateral margins of elytra, denser, coarser and irregular near apex; punctation dual, fine and larger ones intermixed, the latter markedly fewer and deeper, separated by 3-5 diameters, coarser towards sides and apex; lateral and basal margins with sparse semi-erect hairs.

Prosternum (Fig. 4) concealing mouth parts, notched on each side to receive retracted antennae; prosternal process triangular with a pair of convex, basal ridges not reaching up to middle, posteriorly rounded. Elytral epipleuron (Fig. 6) weakly and deeply foveate to receive meso- and metafemoral apices, respectively. Legs with forefemora plate-like, flattened and much broader than those of other pairs; hind tibiae not angulate; tarsi cryptotetramerous. Abdomen (Fig. 7) with five visible sternites; fifth sternite largest, with its posterior margin serrate in both sexes.

Male genitalia with sipho (Fig. 8) sinuate, narrowed towards posterior; tegmen (Fig. 9) with asymmetrical parameres having a tuft of hairs at their apices, median lobe with its apex oblique and slightly upturned. Female genitalia with hemisternite (Fig. 10) elongate, triangular with a stylus; spermatheca (Fig. 11) as figured.

Etymology: The species name refers to the serrate nature of the posterior margin of abdomen.

Material examined: Holotype ♂: INDIA, Karnataka: Bangalore, 16.x.1997, feeding on *Heteropsylla cubana* on *Leucaena leucocephala*, J. Poorani (PDBC). Paratypes: 20, not sexed, with the same data as holotype, but with different dates of collection. Paratypes are to be deposited in The Natural History Museum,



Figs. 1-11. *Serangium serratum* sp. n.: (1) habitus; (2) head; (3) antenna; (4) prosternum; (5) maxilla; (6) elytral epipleuron; (7) abdomen; (8) male genitalia-sipho; (9) male genitalia-median lobe, parameres, trabes; (10) female genitalia-hemisternite; (11) spermatheca (Scale marker = 1 mm, Fig. 1; 0.10 mm, Figs. 2-11).

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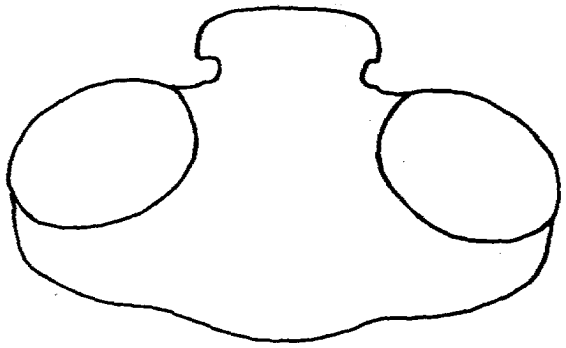
Remarks: This species has some unique characters not found in other Serangiine genera. The genera of Serangiini are not known to have prosternal carinae. In this species, the basal part of prosternal process has distinct convex ridges not reaching up to the middle, which may not amount to true carinae. The serrate posterior margin of the last visible sternite, though found in some Scymnini, is not found in any Serangiine species known so far (R. G. Booth, personal communication). These characters are diagnostic for this species. Besides these, the pyriform antennal club is also characteristic and differs from the more elongate, knife shaped club found in *S. parcesetosum* (Fig. 14) and *S. montazerii*. Further, this is much smaller and darker in colour than the other two species.

Serangium montazerii and *S. parcesetosum* are very similar and can be differentiated mainly by genitalic and also morphological characters (Booth and Polaszek, 1996). In *S. parcesetosum*, eyes are large and the interocular distance at its narrowest is less than twice the eye width (Fig. 12) whereas in *S. montazerii*, the eyes are smaller and the interocular distance is slightly more than twice the eye width (Fig. 13). The elytral punctations are finer and more prominent in *S. montazerii*. The male genitalia of these species are as figured (Fig. 15-18).

Distribution: The distribution of these species seems to be well defined. In India, *S. montazerii* is restricted to the north and also found in Pakistan, Iran and Syria, besides being used as an introduced whitefly predator in Europe and Israel (Booth and Polaszek, 1996). *S. parcesetosum* is found in central and peninsular India. *S. serratum* is currently known from Karnataka.

Host records: *Serangium serratum* is predatory on *H. cubana* on subabul and it is not known if it feeds on *Aleurodicus dispersus* Russell, which infests subabul on a limited scale. In India, *S. parcesetosum* has been recorded on *A. dispersus*, *Bemisia tabaci* Gennadius, *Aleurocanthus woglumi* Ashby, *Aleurolobus barodensis* (Maskell) and *Trialeurodes ricini* (Misra). *S. parcesetosum* has been recently introduced into the USA (Lacey *et al.*, 1993) and Turkey and found promising in controlling the silverleaf whitefly, *Bemisia argentifolii* Bellows & Perring (Legaspi *et al.*, 1996).

Serangium montazerii is predatory on citrus whitefly in northern India. Some of the host records pertaining to *S. parcesetosum* from the north probably refer to *S. montazerii*. It was introduced from Uttar Pradesh, India, into Adzharia, Georgia for the control of citrus whitefly, *Dialeurodes citri* (Ashmead) in 1973 as *Catana parcesetosa* (Sicard). Timofeeva and Hoang (1978) studied its biology and morphology and transferred it to *Serangium*. Booth and Polaszek (1996) corrected this misidentification and clarified its status. It is worth noting here that the recent introduction of *S. parcesetosum* into the USA was from the correct type locality, namely, South India (Kerala).



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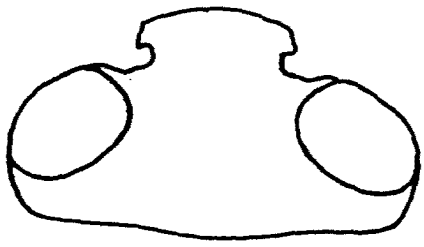

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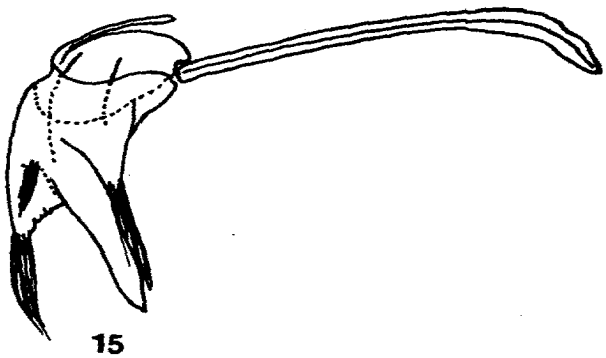

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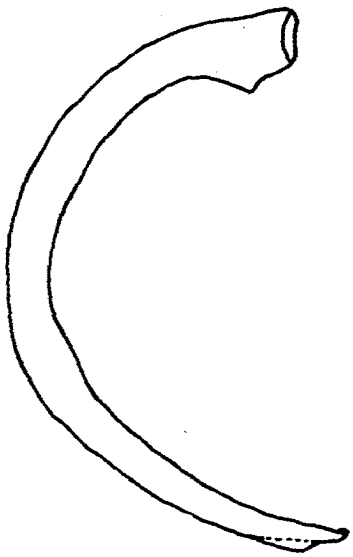

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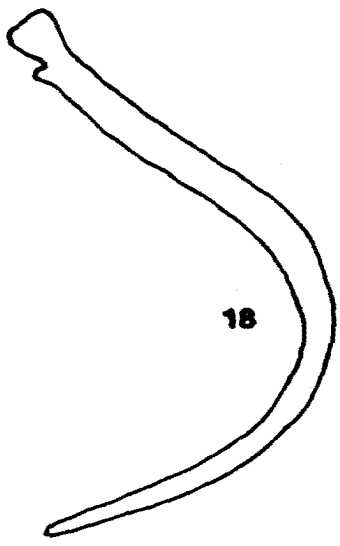

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Figs. 12, 14-16. *S. parcesetosum*. (12) head; (14) antenna; (15) median lobe, parameres, trabes (16) sipho.

Figs. 13, 17, 18. *S. montazerii*. (13) head; (17) median lobe, parameres; (18) sipho (Scale marker = 0.10 mm).

Key to Indian species of *Serangium*

1. Posterior margin of last visible abdominal sternite serrate 2

- Posterior margin of last visible abdominal sternite not serrate 3

2. Antennal club pyriform (Fig. 3). Prosternal process with a pair of convex basal ridges (Fig. 4). Male genitalia with median lobe having an oblique,slightly upturned apex (Fig.9) ..... ***serratum* sp. n.**

- Antennal club elongate, knife shaped (Fig. 14). Prosternal process lacking basal ridges. Male genitalia with median lobe having a pointed apex. 3

3. Eyes large, not widely separated, interocular distance at its narrowest less than twice as wide as the eye (Fig. 12). Male genitalia with right paramere triangular (Fig. 15). Distributed in central and peninsular India. ..... ***parcesetosum* Sicard**

- Eyes smaller, more widely separated, interocular distance at its narrowest slightly more than twiceas wide as the eye (Fig. 13). Male genitalia with right paramere broadly rounded (Fig. 17). Distributed in North India. ..... ***montazerii* Fürsch**

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REFERENCES

Chazeau, J., Fürsch, H. and Sasaji, H. 1990. Taxonomy of Coccinellids (Corrected version). *Coccinella* , **2** (1): 4 - 6.

Blackburn, T. 1889. Further notes on Australian Coleoptera with descriptions of new species. *Transactions of the Royal Society of South Australia*, **11**: 175-214.

Booth, R. G. and Polaszek, A. 1996. The identities of ladybird beetle predators used for whitefly control, with notes on some whitefly parasitoids, in Europe, pp. 69-74. In: *Brighton Crop Protection Conference: Pests and Diseases-1996: Volume 1*. Proceedings of an International Conference, Brighton, UK, 18-21 November 1996.

Casey, T. L. 1899. A revision of the American Coccinellidae. *Journal of the New York Entomological Society*, **7**: 71-163.

Champion, G. C. 1913. Notes on various Central American Coleoptera, with descriptions of new genera and species. *Transactions of the Entomological Society of London*, **1913**: 58-169.

Chapin, E. A. 1940. New genera and species of lady-beetles related to *Serangium* Blackburn (Coleoptera: Coccinellidae). *Journal of the Washington Academy of Sciences*, **30**: 263-272.

Clausen, C. P. 1934. The natural enemies of Aleyrodidae in tropical Asia. *The Philippine Journal of Science*, **53** (3): 253-26

Fürsch, H. 1995. A new *Serangium* species from Iran (Coleoptera: Coccinellidae). *Nachrichtenblatt der Bayerischen Entomologen*, **44**: 20-22.

Kapur, A. P. 1954. A new species of Coccinellidae (Coleoptera) predacious on the citrus whitefly in India. *Records of Indian Museum*, **52**: 189-193.

Korschefsky, R. 1931. Coccinellidae I. Coleopterorum Catalogus. Pars 118, 224 pp., Berlin.

Lacey, L. A., Kirk, A. A. and Hennessey, R. D. 1993. Foreign exploration for natural enemies of *Bemisia tabaci* and implementation in integrated control programs in the United States. *Proceedings, ANPP International Conference on Pests of Agriculture*, **1**: 351-360.

Legaspi, J. C., Legaspi, B. C. Jr., Meagher, R. L. Jr. and Ciomperlik, M. A. 1996. Evaluation of *Serangium parcesetosum* (Coleoptera: Coccinellidae) as a biological control agent of the silverleaf whitefly (Homoptera: Aleyrodidae). *Environmental Entomology*, **25**: 1421-1427.

Miyatake, M. 1961a. A new genus of the Coccinellidae from Japan and the Ryukyu Islands (Coleoptera). *Memoirs of Ehime University*, (6) **6**: 127-133.

Miyatake, M. 1961b. The east-Asian Coccinellid beetles preserved in the California Academy of Sciences, tribe Serangiini. *Memoirs of Ehime University*, (6) **6**: 135-146.

Motschulsky, V. 1866. Essai d'un Catalogue des Insectes de l'île de Ceylon. Supplement. *Bulletin de la Societe Imperiale des Naturalistes de Moscou*, **39** (1): 393-446.

Pruthi, H. S. and Mani, M. S. 1945. Our knowledge of the insect and mite pests of citrus in India and their control. ICAR Scientific Monograph 16, 42 pp.

Sicard, A. 1929. Descriptions de quelques especes nouvelles de Coccinellides de la faune Indo-malaise. *Annals and Magazine of Natural History (Series 10)*, **3**: 179-184.

Timofeeva, T. V. and Hoang, D. N. 1978. Morphology and biology of the Indian ladybird *Serangium parcesetosum* Sicard (Coleoptera: Coccinellidae) predaceous on the citrus whitefly in Adzharia *Entomologicheskoe Obozrenie*, **57**: 302-308.

Woglum, R. S. 1913. Report of a trip to India and the Orient in search of the natural enemies of the citrus whitefly. *Bulletin, United States Department of Agriculture, Bureau of Entomology*, **120**: 1- 58.