

A New Species of *Pempherulus* MARSHALL (Coleoptera, Curculionidae, Conoderinae) Associated with Coastal Hibiscus from the Ryukyus, Southwest Japan

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Abstract A new conoderine weevil, *Pempherulus megaten* KOJIMA et MORIMOTO, sp. nov., associated with *Hibiscus tiliaceus* (Malvaceae) is described from the Yaeyama Islands of the Ryukyus, southwestern Japan. This new species is very similar to the cotton stem weevil, *P. affinis* (FAUST, 1898), which is a serious pest of cotton in India. The distinguishing features of this new species are compared against the type material of *P. affinis*.

The weevil fauna of the Ryukyus in southwestern Japan has not yet been fully investigated (KOJIMA & WATANABE, 2014), particularly in coastal forests, as previous surveys have focused primarily on the mountainous areas further inland. An interesting curculionid species associated with coast hibiscus was found in the Yaeyama Islands. The species belongs to the genus *Pempherulus* MARSHALL, 1941 (Conoderinae), and is the first representative of this genus both for Japan and East Asia.

Pempherulus was established by MARSHALL (1941) for *Pempherus affinis* FAUST, 1898 from India, and another six species from India, the Moluccas, New Guinea and South Africa were included in it at that time. *Pempherulus* belongs to the tribe Mecopini and is characterized by a combination of the following features: prosternum with spines, at least in males; scutellum small; each femora typically provided with low carina on inner and outer faces, and hind femora each with small sharp tooth, not much larger than that of fore pair, usually not, or only slightly, extending beyond elytra.

The biology of *Pempherulus* is poorly known, but the type species, *P. affinis*, is a stem-borer of cotton and other malvaceous trees on which it induces stem galls. Two other species have been bred from stems or wood of Malvaceae plants (MARSHALL, 1924, 1928). As in other Mecopini genera, *Pempherulus* likely contains stem- or wood-borers that have a strong association with Malvaceae.

In this paper, a new species of *Pempherulus*, which is very close to *P. affinis*, is described and the distinguishing features are compared with the type material of *P. affinis*.

The type specimens are preserved in the Laboratory of Entomology, Tokyo University of Agriculture, Atsugi (TUA) and the Kyushu University Museum, Fukuoka (KUM).

Pempherulus megaten KOJIMA et MORIMOTO, sp. nov.

(Figs. 1–4, 7–13)

Male. Length: 2.8–3.6 mm; width: 1.4–1.8 mm.

Derm black; antennae and tarsi reddish brown; head below eyes with dense whitish scales; rostrum with smaller scales of same color on head at sides of basal half; pronotum clothed with buff or dark brown scales, middle of disk with quite indefinite narrow cross formed of sparse white scales, each side of it bordered with rounded stripe formed of buff and white scales, the stripe usually interrupted around middle and with small transverse patch of white scales outside of it, and with elongate

patch in middle of base formed of densely overlapping whitish broad scales; elytra clothed with buff and whitish scales, and variegated with blackish brown scales, margins of suture bearing dense obliquely transverse buff and whitish scales, with small patch of densely overlapping white scales on declivity of 4th interval; lower surface densely clothed with large whitish scales in varying proportions, but buff scales predominating laterally on mesosternum and basal half of sides of metasternum.

Head with eyes often closely approximated, leaving only row of hairy scales or contiguous to each other on posterior margin. Rostrum 1.2–1.3 times as long as pronotum, closely punctate, with five carinae in portion behind antennal insertion, median carina extended anteriorly beyond insertion. Antennae inserted at apical third of rostrum; funicle with 2nd segment slightly shorter than 1st.

Prothorax 1.5 times as wide as long, rounded on sides, widest at middle, rapidly narrowed and constricted near apex, basal angles rounded; dorsum highest near base and sloping forwards, with reticulate punctures throughout, each puncture containing oblong-ovate scale. Scutellum round and bare. Elytra subtriangular, 1.1 times as long as wide, widest at shoulders and narrowing behind in weak curve, with faint, indefinite transverse impression at base, basal margin not elevated, basal half of sutural area depressed, apical margin very finely denticulate; striae deep, each puncture with oblong scale; intervals broader than striae, all of the same height, clothed with oblong-ovate scales. Legs predominantly with buff and whitish, partly brownish scaling and rugosely punctate; femora each with low carina, which is reaching near apex on outer and inner faces, and lacks additional lobe beyond tooth, with dark fleck of brownish scales beyond middle, hind pair slightly exceeding beyond apex of elytra, with subrecumbent plumose scales ventro-internally between base and tooth; tibiae sinuate dorsally near apex.

Sternum of large specimen with prosternal spines, which are curved and higher than fore coxae, hollow between them deep, in small specimen spine short and as height as or lower than fore coxae and hollow shallower or absents. Venter with basal two ventrites depressed in middle, 5th ventrite weakly depressed in middle of apical half.

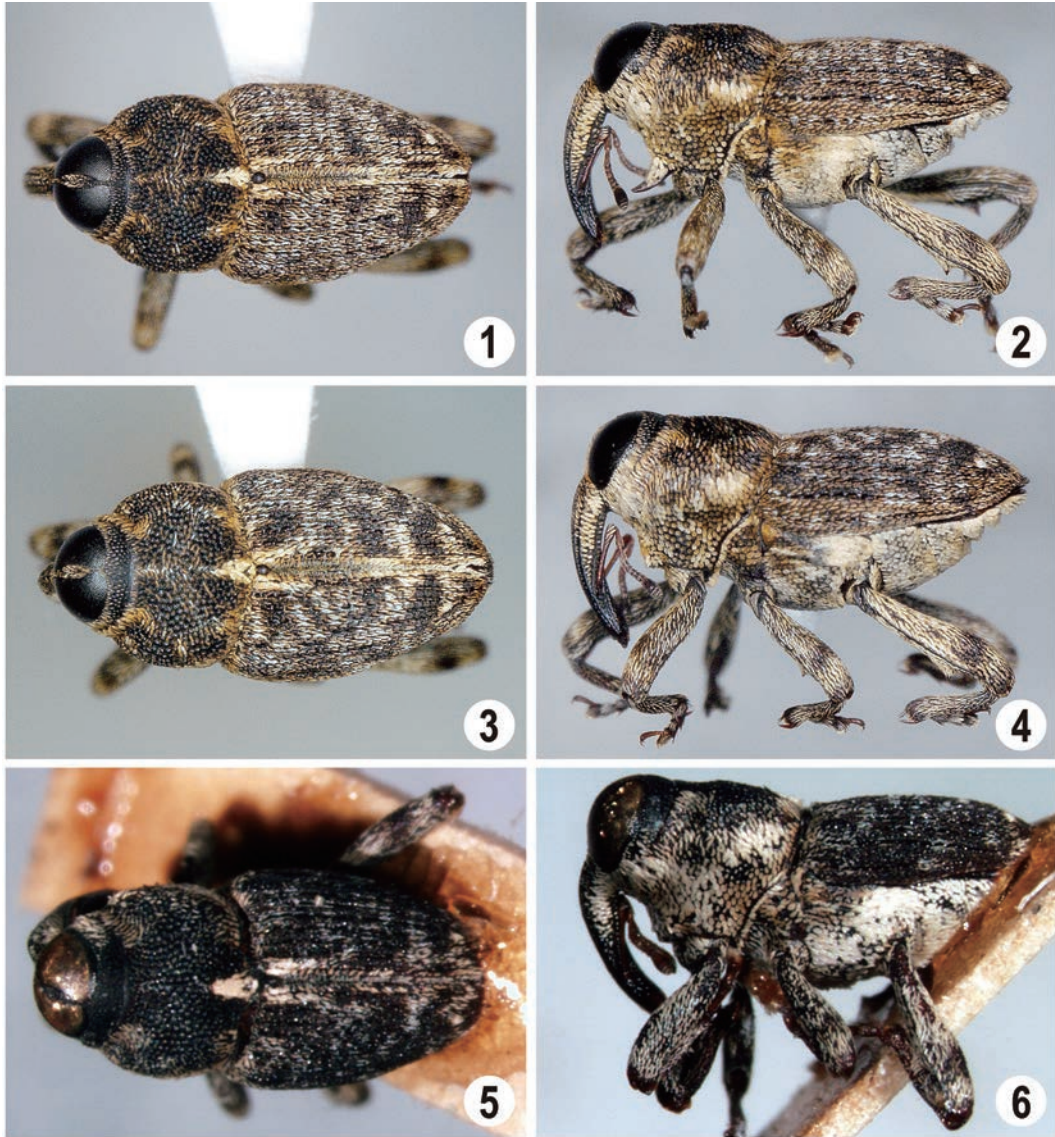
Terminalia as illustrated (Figs. 7–11); sternite 8 paired, lacking setae along caudal margin, spiculum gastrale a little shorter than aedeagus, with V-shaped median sclerite; aedeagus with apodemes longer than body, internal sac divided into two lobes, one of which is very long and bears long flagellum.

F e m a l e. Length: 3.0–3.9 mm; width: 1.6–1.9 mm. Differs from male as follows: eyes approximated at posterior margin, but usually narrowly separated as wide as that of anterior margin; rostrum with median carina not extended anteriorly beyond antennal insertion and sculpture less coarse; hind femora without plumose scales ventro-internally; prosternum with spines very short, hollow between them absents; basal two ventrites inflated.

Terminalia as illustrated (Figs. 12, 13); spermatheca with collum and ramus close to each other and not differentiated.

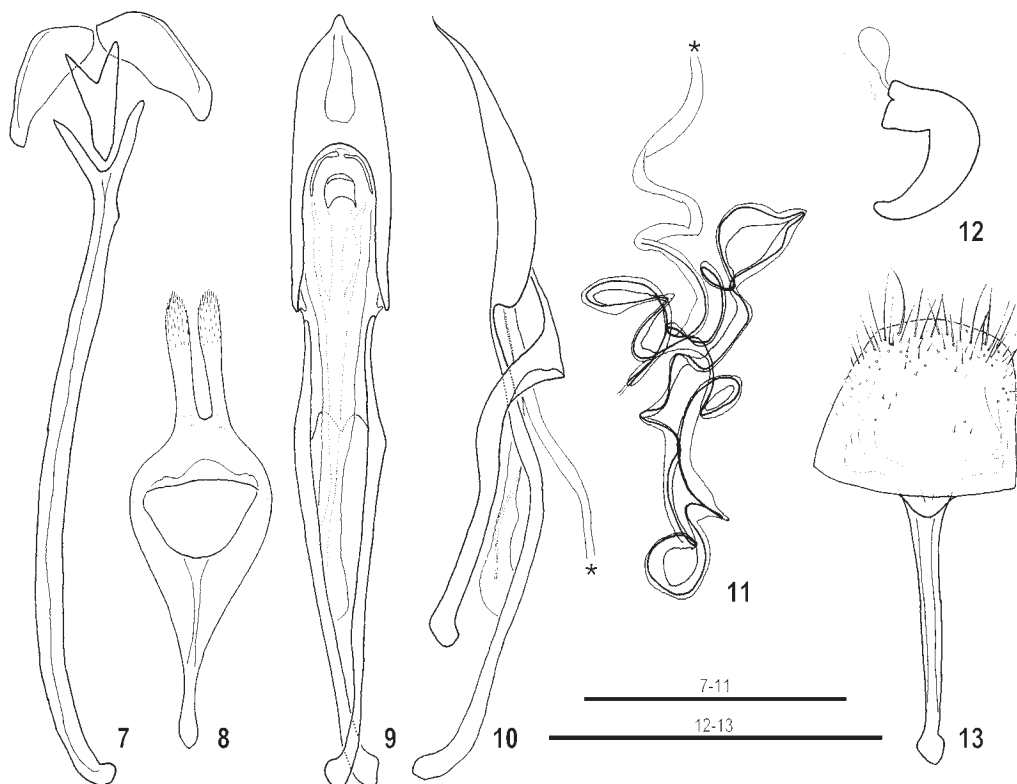
Etymology. The specific name is dedicated to the television program “Megaten!” (meaning to be stunned), that is broadcast by the Nippon Television Network Corporation (Nippon TV) and hosted by Mr. George TOKORO, a famous Japanese comedian. The survey in which this new species was discovered on Iriomote-jima Is. was financially supported by Nippon TV.

Type series. Holotype: ♀, Nakano, Iriomote-jima Is., 1.I.2005, H. KOJIMA leg. (TUA). Paratypes: 1 ♀, Arakawa, 5.III.1964, S. KIMOTO leg. (KUM); 2 ♀♀, Tamatori-saki, Ishigaki-jima Is., 20.XI.1990, K. MORIMOTO leg. (KUM); 2 ♂♂, 2 ♀♀, Yonehara, Ishigaki-jima Is., 22.X.2011, Y. FUJISAWA leg. (TUA); 2 ♂♂, 2 ♀♀, Yarabu, Ishigaki-jima Is., 25.X.2011, Y. FUJISAWA leg. (TUA); 3 ♂♂, 2 ♀♀, Kuroshima Is., 24.IV.1992, H. KOJIMA leg. (TUA); 1 ♂, Ôhara, Iriomote-jima Is., 31.X.1963, G. A. SAMUELSON leg. (KUM); 1 ♂, 12.III.1997, M. T. CHÛJÔ leg. (KUM); 2 ♂♂, Toyohara, 1–3.IV.1978, K.



Figs. 1–6. Habitus photographs of *Pempherulus* spp. — 1–4, *P. megaten* sp. nov. (1, 2, male; 3, 4, female); 5, 6, *P. affinis* (FAUST), type.

BABA leg. (KUM); 1 ♀, Ôhara to Mihara, Iriomote-jima Is., 19.IV.1993, H. KOJIMA leg. (TUA); 7 ♂♂, 2 ♀♀, same data as the holotype (TUA); 2 ♂♂, Shirahama, Iriomote-jima Is., 6.III.1964, T. SHIRÔZU leg. (KUM); 3 ♂♂, 2 ♀♀, 2.I.2005, H. KOJIMA leg. (TUA); 1 ♀, Uehara, Iriomote-jima Is., 1.I.2005, H. KOJIMA leg. (TUA); 1 ♂, Komi (seashore), 28.VII.2014, H. KOJIMA leg. (TUA); 1 ♂, 1 ♀, Haemida, Iriomote-jima Is., 29.VII.2014, H. KOJIMA leg. (TUA); 1 ♂, 29.VII.2014, N. YASUMURA leg. (TUA); 2 ♂♂, 29.VII.2014, J. KANTOH leg. (TUA); 1 ♂, 1 ♀, Funara, Iriomote-jima Is., 30.VII.2014, H. KOJIMA leg. (TUA); 5 ♂♂, 3 ♀♀, Hatoma-jima Is., 16–17.IV.2005, H. KOJIMA leg. (TUA); 1 ♀, Hateruma-jima Is., 22.VI. 1990, T. HANATANI leg. (TUA); 1 ♀, Sonai, Yonaguni-jima Is., 25–29.VIII.1969, H. MAKI-



Figs. 7–13. Male and female terminalia of *Pempherulus megaten* sp. nov. (7–11, male; 12, 13, female). — 7, Sternite 8 and spiculum gastrale; 8, tegmen; 9, aedeagus, dorsal; 10, aedeagus and tegmen, lateral; 11, a part of internal sac; 12, spermatheca; 13, sternite 8. Scale = 0.5 mm.

HARA leg. (KUM).

Distribution. Japan: the Ryukyus (Yaeyama Islands: Ishigaki-jima, Kuroshima, Iriomote-jima, Hatoma-jima, Hateruma-jima and Yonaguni-jima Isls.).

Biology. Weevils were commonly captured on apparently stressed trees of *Hibiscus tiliaceus* (Malvaceae; Oohamabou in Japanese) along coast (Figs. 14, 15).

Remarks. A total of seven *Pempherulus* species are currently known from India, the Moluccas, New Guinea and South Africa. Of these, *P. megaten* is most similar to *P. affinis* (FAUST, 1898), which was described based on a specimen collected from an unknown locality in eastern India (Figs. 5, 6). The original description of *P. affinis* was based on a unique female specimen (not a male as stated in the original description by FAUST, 1898: 319) which have the following features sharing with *P. megaten*: a small, round bare scutellum; unidentate femora, each with a low carina on inner and outer faces, and hind femora each extending slightly beyond the apex of the elytra.

Pempherulus megaten differs from *P. affinis* by having different maculation patterns on the pronotum and elytra, and also based on the following features: in *P. affinis*, lateral areas of pronotum predominantly covered with buff scales, whereas in *P. megaten*, these lateral areas covered with buff and dark brown scales, with rounded stripe and small transverse patch of white scales on each side; except for basal and sutural areas, elytral intervals predominantly covered with blackish-brown oblong



Figs. 14–15. Photographs of habitat and adult food plant of *Pempherulus megaten* sp. nov. — 14, Haemida, Iriomote-jima Is.; 15, stressed trees of *Hibiscus tiliaceus* in Funara, Iriomote-jima Is.

scales, appearing variegated due to white setiferous scales in *P. affinis*, whereas intervals covered with buff and white oblong scales, appearing variegated with blackish-brown oblong scales in *P. megaten*; elytra each provided with shallow transverse impression at base, with basal margin slightly elevated between 1st to 5th striae in *P. affinis*, however, elytra not so impressed at their base that the basal margin elevated in *P. megaten*.

Although the exact type locality of *P. affinis* in eastern India is uncertain, we have a pair of specimens from Thailand (female) and Vietnam (male), which are likely conspecific with *P. affinis*. In the male specimen, each hind femur is provided with erect, plumose scales along the ventro-inner margin between the base and the tooth. This feature is also observed in specimens from India that were identified as *P. affinis* (AYRI & RAMMAMURTHY, pers. comm.). The plumose scales are subrecumbent in *P. megaten*.

Pempherulus affinis, commonly referred to as the cotton stem weevil, is a serious pest of cotton in India, particularly in south of the country (PARAMESWARAN & CHELLIAH, 1984). However, it is necessary to reinvestigate the taxonomy of this species to determine whether it is indeed a single species, particularly since we have collected several undescribed species that are very similar to *P. affinis* in Taiwan, the Philippines and Thailand.

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要 約

小島弘昭・森本 桂：オオハマボウにつく琉球列島産 *Pempherulus* 属の1新種 (鞘翅目ゾウムシ科クモゾウムシ亜科)。—— 八重山諸島の海浜性植物オオハマボウ (アオイ科) から得られたクモゾウムシ亜科の1種を調べたところ、*Pempherulus* 属の未記載種であることが判明したので、*Pempherulus megaten* sp. nov. として新種記載した。本種はインドに分布し、ワタの害虫として知られる *P. affinis* (FAUST, 1898) に近縁と思わ

れるが、前胸や上翅の斑紋等で区別ができる。本属の種はこれまでインド、モルッカ諸島、ニューギニア、南アフリカから知られており、日本ならびに東アジア地域からは今回が初の記録となる。また、上記 *P. affinis* には近似の未記載種が存在し、これまで本種と同定されてきた種がはたして1種であるかどうか今後検討する必要がある。

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