

Discovery of a Highly Modified Species of *Jujiroa* (Coleoptera, Carabidae) on the Japan Sea Side of Central Honshu, Japan¹⁾

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Abstract A new species of the platynine genus *Jujiroa* is described from abandoned tuff mines lying on the southeastern outskirts of Kanazawa, Central Japan, under the name of *J. imunada*. It shows the highest morphological modification within the genus, and is the species first recorded from the Japan Sea side of Honshu.

It has been known for many years that a highly modified platynine of the genus *Jujiroa* occurs in several limestone caves of Gifu Prefecture, Central Japan. It has an elongate head, very long antennae and slender legs, showing the highest adaptation to the subterranean life. Unfortunately, it has not been properly described yet, mainly because of difficulty in obtaining adequate material from single caves. However, its occurrence in Gifu Prefecture situated midway between the Pacific Ocean and the Japan Sea is most interesting from the zoogeographical viewpoint, since all the other Japanese members of the genus, both described and undescribed, are distributed along the Pacific side of West Japan, from the Tenryû-gawa drainage area in the east to the Gotô Islands in the west (cf. UÉNO & SAITO, 1991, pp. 1–2).

Late in the spring of this year, two specimens of a *Jujiroa* were collected by Mr. Masayuki IMURA in an abandoned adit of a tuff mine lying on the southeastern outskirts of Kanazawa in Ishikawa Prefecture and were submitted to me for examination through the courtesy of Mr. Syôji TAKABA. It was evident at a glance that they belong to a species either identical with or very closely related to the undescribed one from Gifu Prefecture. At my request, IMURA and his fellows obtained a series of additional specimens from the same adit and two others nearby, which were sufficient for description of the new species. Early in the autumn, Professor Yoshiaki NISHIKAWA and I paid a hurried visit to the mine adits for examining the habitat condition and the mode of life of the platynine, and now I have gained full information about the beetle.

The discovery of this new species is very important for several reasons. It is important taxonomically because of the isolated status of the platynine; it is important biospeologically because of its striking modification adaptive to the hypogean existence; and it is important zoogeographically because no other species of the genus have ever

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been met with from the Japan Sea side of Honshu. Taking all these considerations into account, I am going to introduce the new species into science in the present paper under the name *Jujiroa imunada*, although systematic status of the Gifu populations still remains unclarified. The specific name *imunada* is formed from an arbitrary combination of letters taken from the names of the three collectors, *IMU-RA*, *NAKANISHI* and *UE-DA*, whose efforts led to the brilliant discovery of the new platynine. The abbreviations used herein are the same as those explained on page 3 of the paper by UÉNO and SAITO (1991) on the Taiwanese species of the genus.

Before going further, I wish to express my heartfelt thanks first of all to Messrs. Masayuki IMURA, Shigeo NAKANISHI and Noboru UEDA, without whose careful collectings this study could never have been taken up. Deep appreciation is also expressed to Mr. Syôji TAKABA, Dr. Ichiji TOGASHI and Professor Yoshiaki NISHIKAWA for giving kind support to my study.

Jujiroa imunada S. UÉNO, sp. nov.

[Japanese name: Higenaga-hora-hirata-gomimushi]

(Figs. 1–3)

Length: 9.8–11.7 mm (from apical margin of clypeus to apices of elytra).

Recognized at first sight on its slender facies, with elongate head, narrow prothorax, and very long slender appendages. Colour reddish brown, shiny; head except for the anterior half of dorsum, pronotal disc, elytra, venter of mesothorax, and epipleura usually infuscated; reflexed lateral parts of pronotum each with an irregular row (partially rows) of dark punctiform spots; appendages usually somewhat lighter than body. In freshly mature individuals, body concolorously reddish brown with somewhat paler appendages, except for head which is infuscated as in old ones. Inner wings absent.

Head elongate, usually about 1.35 times as long as wide, widest at the mid-eye level and gradually narrowed towards narrow neck which is almost cylindrical, genal parts either straight or only very slightly convex in dorsal view; neck constriction not sharply marked though continuous onto dorsum; dorsal surface well convex and smooth, with short wide frontal impressions subparallel to each other and hardly extending to the level of the anterior margins of eyes; two pair of supraorbital pores present on lines subparallel to each other; microsculpture fine but distinct, consisting mostly of wide meshes, partially of isodiametric ones and irregularly transverse lines; eyes small, usually flat though feebly convex in some individuals, $3/7$ – $4/7$ as long as genae in ♂, $2/5$ – $1/2$ as long as genae in ♀; labrum transversely oblong, with the apical margin either straight or slightly bisinuate; mandibles fairly long, sharply arcuate at the apical parts; mentum bisetose, with a pair of ante-basal foveoles which are fairly deep; mentum tooth stout, sharply bifid at the tip; palpi long and slender, with thin penultimate segments very gradually dilated towards apices; antennae long and thin, reaching apical tenth (sometimes apices) of elytra in ♂, usually somewhat shorter

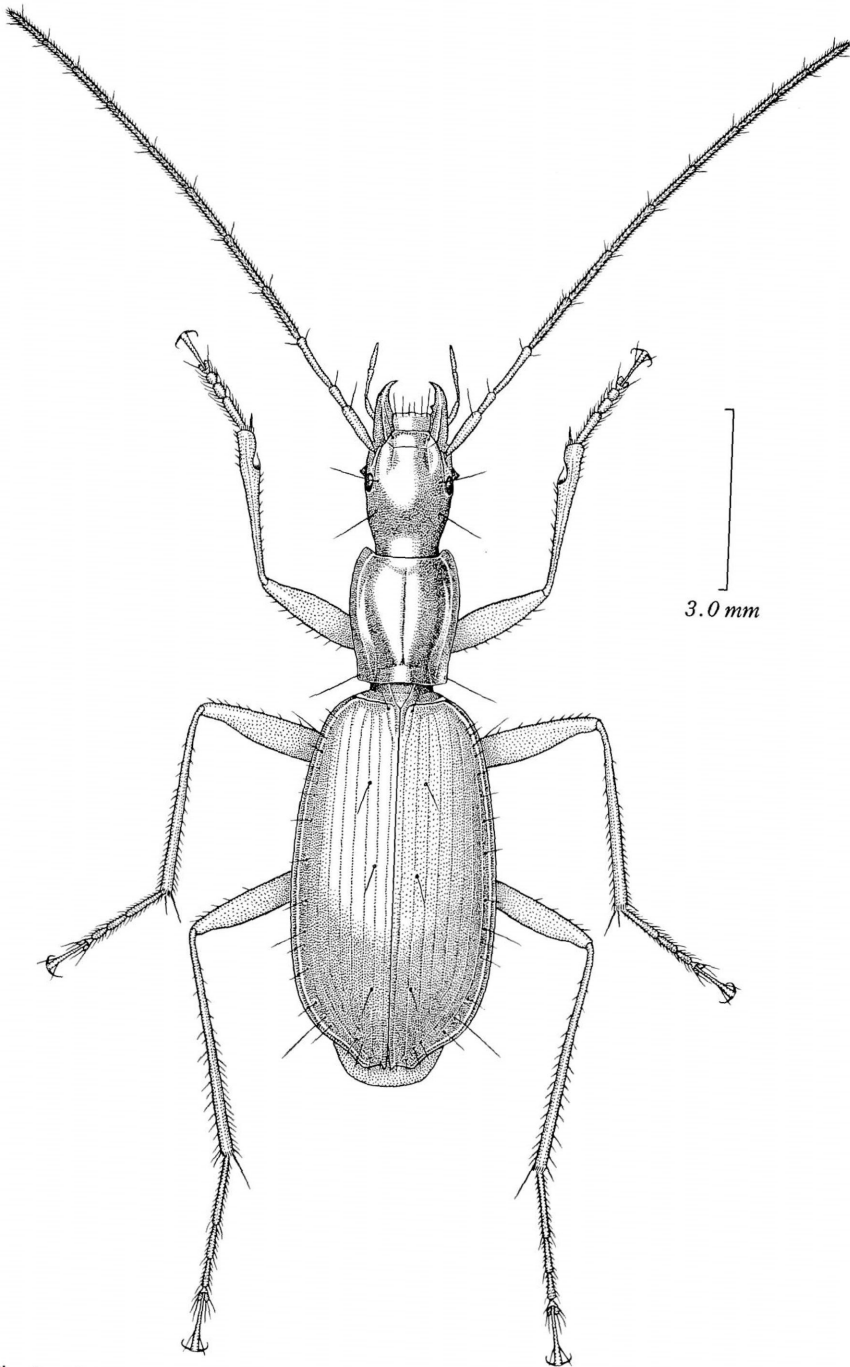
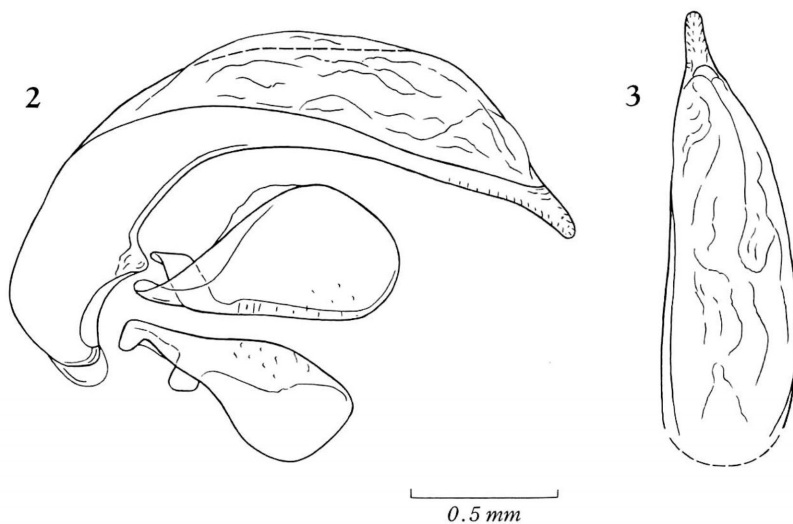


Fig. 1. *Jujiroa imunada* S. UÉNO, sp. nov., ♂, from an abandoned mine adit at Aodani in Kanazawa-shi.

than that in ♀, segment 4 the longest though obviously narrower than scape, fully 7 times as long as wide, segments 3, 5 and 6 subequal in length to one another, each slightly shorter than segment 4 and slightly longer than scape, segments 7–11 gradually decreasing in length and becoming about 2/3 the length of 4 at the terminal segment, segment 2 the shortest, a little more than a half as long as the terminal.

Pronotum variable to some extent in configuration though wider than head and always a little longer than wide, usually widest at about two-thirds from base, though the widest level varies from five-ninths to seven-tenths from base according to individuals; PW/HW 1.27–1.35 (M 1.32), PL/PW 1.03–1.14 (M 1.08), PW/PA 1.44–1.60 (M 1.52), PW/PB 1.21–1.36 (M 1.29); sides widely explanate and sharply reflexed throughout, especially in posterior third including hind angles, feebly arcuate from front angles to near base in many specimens examined, but in some individuals, the lateral sides are rather strongly arcuate before the widest part and almost straightly, though gradually, narrowed behind towards hind angles, ante-basal sinuation usually distinct though very shallow, lying between basal sixth and fifth, rarely rather deep and more rarely null, basal portions either subparallel to each other or slightly convergent posteriad in most specimens examined but rarely divergent towards hind angles; apex either straight or shallowly emarginate, always narrower than base though variable in width according to individuals, PB/PA 1.11–1.25 (M 1.18), with front angles triangularly produced forwards and narrowly rounded at the tips; base straightly truncated at middle and more or less oblique on each side inside hind angle, which is either obtuse or nearly rectangular and always narrowly rounded at the corner; postangular pair of marginal setae either inserted on hind angles or slightly removed forwards, anterior pair absent as usual; disc moderately convex, with vague transverse striations, median line distinct, not reaching apex but sometimes reaching base, apical transverse impression vague, basal transverse impression shallow and mal-defined, though continuous; basal foveae deep, extending anteriorly along marginal gutters as arcuate furrows, which are either continuous or interrupted at about basal third but always deeply impressed near the widest part and reach near front angles; basal area narrow and somewhat uneven; microsculpture distinct, consisting of fine transverse lines partially forming wide meshes.

Elytra elongate, much wider than prothorax, narrow at bases, gradually dilated towards the middle which is the widest, and ample in apical halves; EW/PW 1.81–2.01 (M 1.90), EL/EW 1.63–1.77 (M 1.70); shoulders effaced; basal border slightly arcuate, either roundly continuing to lateral border or meeting with the latter at a very obtuse angle at the base of interval 6, the latter widening posteriorly and rather widely explanate and reflexed, almost straight in front, and then very feebly arcuate to near preapical emargination which is very shallow; apices narrowly but distinctly truncate and sharply mucronate on each side of a narrow re-entrant angle at suture, the lateral angle of apical truncature usually distinct though obtuse, rarely rounded; dorsum rather flat though the sutural areas are usually raised in apical halves, each elytron usually depressed in basal area and frequently also before apex; striae clearly im-



Figs. 2-3. Male genitalia of *Jujiroa imunada* S. UENO, sp. nov., from an abandoned mine adit at Aodani in Kanazawa-shi; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

pressed throughout and often deepened apically, either smooth or very faintly crenulate, stria 8 always deepened in apical part; scutellar striole short but distinct; intervals flat; basal pore present at the base of interval 1; three dorsal pores present on interval 3, the proximal one adjoining stria 3 at $1/6-1/3$ from base, and the posterior two adjoining stria 2 at $1/2-5/8$ and $5/8-4/5$ from base, respectively, the proximal pore rather frequently and the middle pore rarely lacking on one elytron; apical pores usually four in number, one at the apex of interval 1 and the other three adjoining the apical part of stria 7; marginal series of umbilicate pores 14-18 (usually 16) in number; microsculpture distinct, mostly consisting of fine transverse lines.

Ventral surface smooth; anal sternite with the apical margin more regularly arcuate in ♂ than in ♀, bearing a pair of marginal setae in the former, two pair of them in the latter. Legs long and slender; tarsi thin, segments 1-4 deeply bisulcate and longitudinally striate between the lateral sulci, segment 1 obviously longer than segments 2-3 together in mesotarsus but as long as that in metatarsus, segment 4 deeply bilobed in pro- and mesotarsi, deeply emarginate at the apex in metatarsus, segment 5 provided with a pair of dorsal setae in addition to the ordinary pair; in ♂, protarsal segments 1-3 gently dilated and furnished beneath with adhesive appendages.

Male genital organ small though moderately sclerotized. Aedeagus about one-third as long as elytra, gently depressed, strongly arcuate in basal half, and widely membranous on the left dorsal side, with the left wall much reduced; basal part globular, moderately emarginate at the sides of rather small basal orifice, with a small hyaline sagittal aileron; apical lobe relatively short, rod-like and straight, slightly

curved ventrad at the base and blunt at the extremity; inner sac inerm. Left style conchoidal, widely rounded at the apex; right style relatively large though obviously smaller than the left.

Type series. Holotype: ♂, allotype: ♀, Aodani, 18-V-1993, M. IMURA & S. NAKANISHI leg. Paratypes: 2 ♀♀, Aodani, 6-V-1993, M. IMURA leg.; 1 ♂, 2 ♀♀, Aodani, 22-V-1993, M. IMURA & S. NAKANISHI leg.; 1 ♂, 1 ♀, Aodani, 3-VI-1993, M. IMURA leg.; 1 ♂, 3 ♀♀, Aodani, 23-IX-1993, S. UÉNO leg.; 1 ♀, Aodani, 26-IX-1993, S. TAKABA leg.; 2 ♂♂, 4 ♀♀, Seryô, 6-VI-1993, M. IMURA, S. NAKANISHI & N. UEDA leg.; 1 ♂, 3 ♀♀, Seryô, 19-VII-1993, S. TAKABA leg.; 1 ♂, 11 ♀♀, Seryô, 23-IX-1993, S. UÉNO leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo. Two of the paratypes collected in September are teneral specimens.

Localities. A mine adit at Aodani (110 m in altitude; type locality!), and two mine adits at Seryô (120 m and 130 m in altitude), both in Kanazawa-shi of Ishikawa Prefecture, on the Japan Sea side of central Honshu, Japan.

Notes. Of the four distinctive Japanese species of *Jujiroa* hitherto described (excluding *J. onoi* TAKAKURA, 1987, whose systematic status is problematical), *J. troglodytes* S. UÉNO (1955, p. 57, fig. 1, pl. 1, fig. b; HABU, 1978, pp. 268, 271, figs. 532, 535, 537, 540, 544, 546, pl. 25, fig. 2) may be nearest to *J. imunada*. The two species are identical not only in labial and tarsal conformation, but also in convex head, flattened hind body, and number of the dorsal and marginal pores of elytra. On the other hand, *J. imunada* differs from *J. troglodytes* in the presence of the basal pore and the number of the apical pores of elytra beside the striking modification of its facies adaptive to the hypogean existence. Perhaps it is not wise to recognize a species-group of its own for *J. imunada*, although inexperienced workers may be tempted to take such an action.

The present new species has so far been known from three abandoned adits of tuff mines excavated into the cliffs on both sides of the Sai-kawa River, one on the left side and two on the right, one above the other. These cliffs are located about 8 km southeast of the city centre of Kanazawa, near the threshold of mountainous areas. The beetle is not so rare as most other species of the genus, and is most easily met with by trapping in the lower adit at Seryô, which is on the right side of the valley. It is cursorial to a certain extent, since several individuals have been observed crawling on walls or even ceilings of the adit. It is also found from among rock debris, usually in wet places but sometimes in rather dry spots. It runs very quickly when disturbed and rushes for crevices or narrow spaces of the debris, to which fits its flattened body rather unusual for a highly specialized hypogean beetle.

As was mentioned in the introduction of this paper, a *Jujiroa* closely similar to the present species has been known from several limestone caves in Gifu Prefecture. It is different from the latter in some minor details and could be separated as a geographical race or even a species if those differences were proved stable. At the present moment, however, I prefer to refrain from proposing a new name for the Gifu popu-

lation, leaving a solution of the problem for future investigations.

要 約

上野俊一：本州中央部の日本海側におけるいちじるしく特殊化したホラアナヒラタゴミムシの発見。——金沢の南東に位置する犀川兩岸の崖には、緑色凝灰岩を採掘するために掘られた坑道の跡が残っている。これらの廃坑のひとつから、今年の5月に、地下生活へのいちじるしい形態的適応を示す、ホラアナヒラタゴミムシの1新種が発見された。この種は、体形が細く、長い頭部や幅の狭い前胸部、いちじるしく細長い触角や肢をもつことによって、既知の邦産種からひとめで区別できる。井村正行、中西重雄および上田 昇の3氏によるその後の調査で、ほかの2本の坑道にも同じ種の生息していることが確かめられた。ホラアナヒラタゴミムシ属の甲虫類は、主として西日本の太平洋側に分布し、本州の日本海側からは見つかったことがなかったので、今回の発見は、分類学的な観点からばかりでなく、生物地理学的にも洞窟生物学的にもきわめて重要なものである。それで、この新種にヒゲナガホラヒラタゴミムシ *Jujiroa imunada* S. UÉNO という新名を与え、本論文に記載した。

References

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