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NEW SPECIES OF THE GENUS *STENOPSOCUS* HAGEN, 1866 (INSECTA: PSOCODEA) FROM VIETNAM

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Summary. Two species of the genus *Stenopsocus* Hagen, 1866 (Insecta: Psocodea) are described from Vietnam, namely *S. beroni* Georgiev et Quang-Manh, **sp. n.** and *S. tamdaoi* Georgiev et Quang-Manh, **sp. n.** The challenges of species identification in *Stenopsocus*, particularly regarding morphological variability and the importance of genetic analysis, are discussed.

Key words: insects, taxonomy, new species, tropical forest, Indochina.

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Резюме. Из Вьетнама описаны два вида рода *Stenopsocus* Hagen, 1866 (Insecta: Psocodea): *S. beroni* Georgiev et Quang-Manh, **sp. n.** и *S. tamdaoi* Georgiev et Quang-Manh, **sp. n.** Обсуждаются проблемы идентификации видов у *Stenopsocus*, особенно в отношении морфологической изменчивости и важности генетического анализа.

INTRODUCTION

The species of the family Stenopsocidae exhibit significant diversity in the Oriental region, with over 140 species documented in this area, of them *Stenopsocus tonkinensis* Enderlein, 1903 and *Graphopsocus vietnamicus* Liang, Li et Liu, 2013 are known from Vietnam, *S. externus* Banks, 1937 is found in both Vietnam and Laos, while *S. wangi* Liang, Li et Liu, 2017, *S. abnormis* Liang, Li et Liu, 2017 and *Malostenopsocus lacteus* Liang, Li et Liu, 2017 are described only from Laos (Banks, 1937; Liang *et al.*, 2013, 2017).

In this paper, we present descriptions of two new *Stenopsocus* species collected from the Tam Dao National Park in Vietnam.

MATERIAL AND METHODS

Psocoptera specimens were collected from the Tam Dao National Park in Vietnam during October 2023 by beating the vegetation. The collected material was stored in 96% ethanol, and later has been deposited at the National Museum of Natural History, Sofia, Bulgaria (NMNH).

Measurements abbreviations: LC – body length; F+tr – hind femur and trochanter length; T – hind tibia length; t1, t2, t3 – tarsomeres of hindtarsus (lengths measured from condyle to condyle); FW – forewing; HW – hindwing; D – anteroposterior diameter of the compound eye; IO – shortest distance between compound eyes.

TAXONOMY

Family Stenopsocidae

Stenopsocus beroni Georgiev et Quang-Manh, **sp. n.**

<https://zoobank.org/NomenclaturalActs/1AFD0CFD-DFBA-40E4-97BF-5B408046727B>

Fig. 1

MATERIAL. Holotype: 1 ♀, **Vietnam:** Vinh Phuc Province, Tam Dao National Park, Tam Dao, ab Chua Vang Tam Dao, 21.46058° N 105.64864° E, h=1067 m, 16.X 2023, leg. V. Quang-Manh, M.Langourov, N.Van-Hieu, L.Thai-Hoang (NMNH).

DESCRIPTION. The species displays a generally yellowish coloration. The head is dark brown with a paler, creamy vertex, featuring a distinct dark brown margin on the backside. A wide stripe of dark brown pigment connects the compound eyes, extending over the ocelli. The frons is lighter and creamy, resembling the vertex.

The postclypeus is dark brown, while the anteclypeus and labrum are whitish. Palpi are creamy-whitish with a darker apex. Antennae are dark brown, almost blackish, with a light brown-creamy pedicel and scutum. Compound eyes are black, and the ocelli are pale. The thorax is dark brown with a pale median area. The femur is yellow, while the tibia and t1 are gray-yellow, and t2 is darker gray. The abdomen is yellow ventrally, including the subgenital plate, and purplish-creamy dorsally. Terminalia is dark brown. Forewings are hyaline, with dark veins and a yellow pterostigma. The external edge of the pterostigma is broadly bordered with deep black pigment, extending along the crossvein and almost reaching Rs. Similar dark pigment is present along R. The hind wing is transparent with blackish pigment along R.

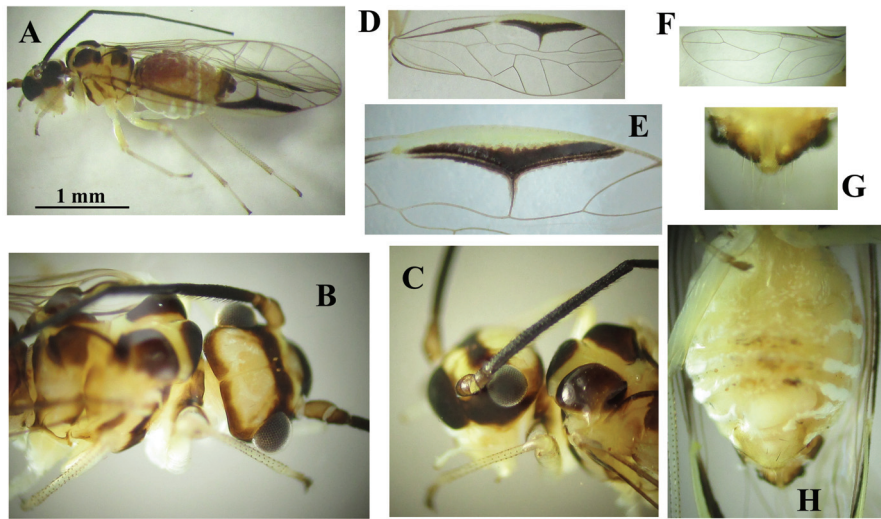


Fig. 1. *Stenopsocus beroni* sp. n., holotype, female: A – lateral view, B – dorsal view of the head, C – lateral view of the head, D – forewing, E – close view of the pterostigma pigmentation, F – hindwing, G – ventral view of epiproct and paraproct, H – ventral view of the abdomen.

Morphology. The subgenital plate bears short hairs, with apical hairs approximately three times longer. Both the epiproct and paraproct are triangular in shape, adorned with long hairs. The forewing surpasses the body in length. No setae are observed on Cu2. The pterostigma exhibits a slight angulation at the crossvein. Additionally, t2 is approximately two times shorter than t1.

Measurements (in mm). Holotype, female: LC = 2.61; F+tr = 0.90; T = 1.18; t1 = 0.36, t2 = 0.14, FW = 3.00, HW = 2.20, D = 0.10, IO = 0.40, IO/D = 4.

Male. Unknown.

DIAGNOSIS. Considering head pigmentation, the new species is most closely related to *S. externus*, which exhibits a thin brown border at the backside of the vertex

and a pale brown pedicel and scutum. However, *S. beroni* sp. n. differs from this species in several aspects. Firstly, it possesses a yellow subgenital plate, contrasting with the characteristics of *S. externus*. Additionally, the coloration of the pterostigma differs between the two species. Moreover, *S. beroni* sp. n. exhibits a distinct head pattern characterized by a pale frons and a characteristic brown "mask" along the compound eyes. While a similar light area between the antennae was described in *S. tonkinensis*, this species differs in having a brown vertex, and it is considerably larger in size (forewing of 5 mm). Although the pterostigma coloration of *S. beroni* sp. n. resembles that of *S. formosanus* Banks 1937, with both species displaying similar patterns, the forewing of *S. beroni* sp. n. features a black irregular spot on R, and the scutum and pedicel are darker.

HABITAT. The species was collected in a mountain rainforest from bush and tree branches.

ETYMOLOGY. The species is named after Prof. DSc Petar Beron who initiated the Bulgarian-Vietnamese expeditions in the area.

***Stenopsocus tamdaoi* Georgiev et Quang-Manh, sp. n.**

<https://zoobank.org/NomenclaturalActs/9F578CC1-0671-4BBE-8026-3E2C4EECDE2D>

Fig. 2

MATERIAL. Holotype: 1 ♀, **Vietnam:** Vinh Phuc Province, Tam Dao National Park, Tam Dao, ab Chua Vang Tam Dao, 21.46058° N 105.64864° E, h=1067 m, 16.X 2023, coll. V. Quang-Manh, M. Langourov, N. Van-Hieu, L. Thai-Hoang (NMNH). Paratype: 1 ♀, same locality and deposition.

DESCRIPTION. The species generally exhibits a dark brown coloration with some paler areas on the body. The head is dark brown with a paler, creamy vertex, featuring a distinct dark brown margin on the backside. Both the frons and postclypeus are dark brown, while the anteclypeus, labrum, and palpi are whitish. Antennae are dark brown, compound eyes are black, ocelli pale. The thorax is dark brown, with a pale median area. The femur is white, while the tibia and t1 are gray-yellow, and t2 is darker gray. The abdomen is brown, with the second distal ventral area being white-yellow. Terminalia are dark brown. Forewings are hyaline, with dark veins and a yellow pterostigma. The posterior external area of the pterostigma is broadly covered by deep black pigment, extending along the crossvein and covering R2+3. Similar dark pigment is present along R. The hindwing is transparent, with a grayish hue along R.

Morphology. No any setae present on Cu2. Tibia shorter than femur+trochanter. Forewing shorter than body length. T2 about three times shorter than t1. Subgenital plate with long hairs apically, sclerotized. Epiproct and paraprocts triangular, with long hairs.

Measurements (in mm). Holotype, female: LC = 3.26; F+tr = 0.86; T = 0.80; t1 = 0.32, t2 = 0.08, FW = 3.22, HW = 2.40, D = 0.10, IO = 0.40, IO/D = 4.

Male: Unknown.

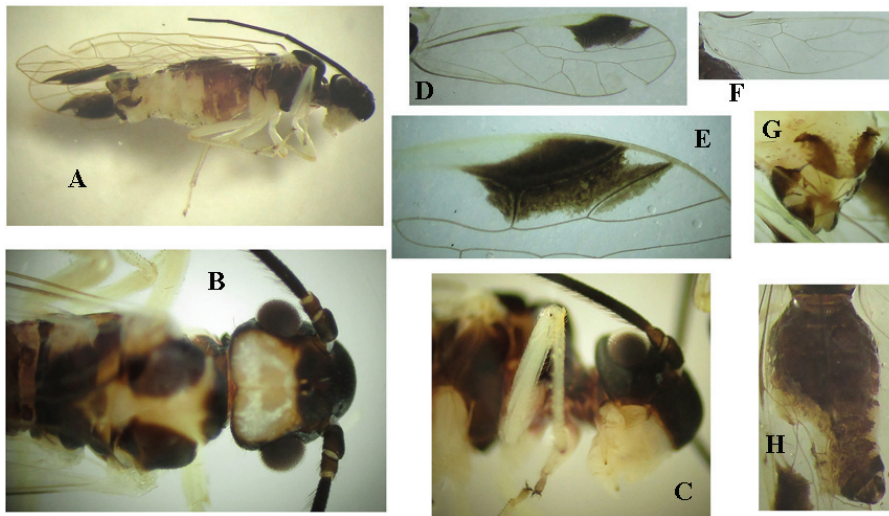


Fig. 2. *Stenopsocus tamdaoï* sp. n., holotype, female: A – lateral view, B – dorsal view of the head, C – lateral view of the head, D – forewing, E – close view of the pterostigma pigmentation, F – hindwing, G – ventral view of subgenital plate, epiproct and paraproct, H – dorsal view of the abdomen.

DIAGNOSIS. Considering body coloration, the new species is most closely related to *S. externus*. However, *S. tamdaoï* sp. n. differs from this species by having a dark brown pedicel and scutum, as well as a distinct shape and larger size of the dark spot on the forewing.

HABITAT. The species was collected in a mountain rainforest from bush and tree branches.

ETYMOLOGY. The species is named after Tam Dao National Park where it was found.

CONCLUSION

Identifying species of *Stenopsocus* presents challenges due to the variability in female gonapophyses and the nearly identical male genitalia, particularly the phallosomes, which exhibit very similar characteristics across different species, thereby offering limited information for species differentiation (Saville, 2009). Recent genetic studies have demonstrated that body pigmentation especially that of the head and forewings, serves as a reliable character for species delimitation (Liang *et al.*, 2015, 2017). This approach has been adopted and applied in the present paper. Further research and exploration are necessary to enhance our understanding of *Stenopsocus* species diversity and taxonomy in the Oriental region.

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