



Fig. 4. *Brachyphyllophagus phantassus* sp. nov., holotype PIN, № 2384/260: (a) insect abdomen with leaf fragments; (b, c) fragments of leaf cuticle with stomatal grooves, SEM ($\times 250$).

able on the basal dark band, distal to the latter they are sparse or absent (not preserved?).

Measurements (mm): body length, no less than 32; length of antenna, ca. 18; forewing length, 27; length of fore tibia, ca. 3.8; head width, 4.6; forewing width, no less than 5.

Comparison. Distinct from the type species in the somewhat larger size, setaceous antennae of the longer and more slender segments, longer and less oblique RS and MA bases, curved and more numerous Cu branches, more dense crossveins on the basal dark band, and much less variegate dark pattern (but with the hindwings suffused).

Remarks. On the fragments of the thick leaf cuticle preserved in the gut of *Brachyphyllophagus phantassus* (Pl. 9, fig. 6) the sunken stomatal grooves with the small isodiametric cells of irregular outline and with the transversely or obliquely oriented, relatively large, monocyclic stomatal apparatuses are clearly visible. The stomatal grooves are separated by the wide zones lacking the stomata of the narrow, thin-walled cells with wedge-shaped ends, arranged in transverse rows. Such an epidermal structure is encountered in several *Brachyphyllum* species, for example in *Brachyphyllum ardenicum* Harris (Harris, 1979).

Material. Holotype.

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REFERENCES

- Doludenko, M.P. and Orlovskaya, E.R., Jurassic Flora of Karatau, in *Tr. Geol. Inst. Akad. Nauk SSSR* (Moscow), 1976, vol. 284, pp. 1–264.
- DuPorte, E.M., Origin of the Gula in Insects, *Canad. Entomol.*, 1962, vol. 40, pp. 381–384.
- Gorochov, A.V., On Permian and Triassic Phasmoptera from Eurasia, *Paleontol. Zh.*, 1994, no. 4, pp. 64–75.
- Gorochov, A.V., Phasmomimidae: are they Orthoptera or Phasmatoptera?, *Paleontol. Zh.*, 2000, no. 3, pp. 67–72.
- Harris, T.M., *The Yorkshire Jurassic flora. V. Coniferales*, London: British Mus. (Nat. Hist.), 1979.
- Krassilov, V.A., *Origins of Angiosperms*, Sofia: Pensoft, 1997.

- Krassilov, V.A. and Rasnitsyn, A.P., A Unique Find: Pollen in the Gut of the Early Cretaceous Sawflies, *Paleontol. Zh.*, 1982, no. 4, pp. 83–96.
- Krassilov, V.A. and Rasnitsyn, A.P., Pollen in the Gut of Permian Insects: First Evidence of Pollinivory and Its Evolutionary Significance, *Lethaia*, 1997, vol. 29, pp. 369–372.
- Krassilov, V.A., Zherikhin, V.V., and Rasnitsyn, A.P., Pollen in the Gut of Fossil Insects as Evidence of Coevolution, *Dokl. Ross. Akad. Nauk*, 1997a, vol. 354, no. 1, pp. 135–138.
- Krassilov, V.A., Zherikhin, V.V., and Rasnitsyn, A.P., *Classopollis* in the Gut of Jurassic Insects, *Palaeontology*, 1997b, vol. 40, no. 4, pp. 1095–1101.
- Meyen, S.V., Basic Features of Gymnosperm Systematics and Phylogeny as Evidenced by the Fossil Record, *Botan. Review*, 1984, vol. 50, no. 1, pp. 1–111.
- Rasnitsyn, A.P., Origin and Evolution of Lower Hymenoptera, in *Tr. Paleontol. Inst. Akad. Nauk SSSR* (Moscow), 1969, vol. 123, pp. 1–196.
- Rasnitsyn, A.P., Origin and Evolution of Hymenopterous Insects, in *Tr. Paleontol. Inst. Akad. Nauk SSSR* (Moscow), 1980, vol. 174, pp. 1–192.
- Rasnitsyn, A.P. and Krassilov, V.A., The First Find of Pollen in the Gut of Lower Permian Insects, *Paleontol. Zh.*, 1996a, no. 3, pp. 119–124.
- Rasnitsyn, A.P. and Krassilov, V.A., *Sojanidelia floralis* sp. nov. (Insecta: Grylloblattida: Ideliidae)—One More Pollen Consumer of the Permian Gymnosperms, *Paleontol. J.*, 1996b, vol. 30, no. 6, pp. 716–722.
- Rähle, W., Untersuchungen an Kopf und Prothorax von *Embia ramburi* Rimsky-Korsakow, 1906 (Embioptera, Embiidae), *Zool. Jahrb. Anat.*, 1970, vol. 87, pp. 248–330.
- Ross, E.S., Embioptera, in *The Insects of Australia*, 2nd ed. Carleton, Victoria: Melbourne Univ. Press, 1991, vol. 1, pp. 405–409.
- Sharov, A.G., *Basic arthropodan stock*, London, New York: Pergamon Press, 1966.
- Sharov, A.G., Phylogeny of Orthopteroid Insects, in *Tr. Paleontol. Inst. Akad. Nauk SSSR* (Moscow), 1968, vol. 118, pp. 1–217.
- Storozhenko, S.Yu., System and Phylogeny of the Order Grylloblattida (Insecta), in *Chiteniya pamyati A.I. Kurentsova*, vol. 7, Vladivostok: Dal'nauka, 1997, pp. 21–56.
- Zherikhin, V.V., Development and Change of Cretaceous and Cenozoic Faunal Assemblages (Tracheata and Chelicerata), in *Tr. Paleontol. Inst. Akad. Nauk SSSR* (Moscow), 1978, vol. 165, pp. 1–200.
- Zherikhin, V.V., Insects in Terrestrial Ecosystems, in *Tr. Paleontol. Inst. Akad. Nauk SSSR* (Moscow), 1980, vol. 175, (Historical Development of The Class Insecta), pp. 189–224.