



## ***Psorodonotus venosus* group (Orthoptera, Tettigoniidae; Tettigoniinae): geometric morphometry revealed two new species in the group**

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### **Abstract**

*Psorodonotus* (Orthoptera, Tettigoniidae) includes 11 species distributed in Caucasus, Anatolia and Balkans. Although its present taxonomy is problematic, mainly three species groups can be distinguished; (i) The **Specularis Group**, (ii) The **Caucasicus Group** and (iii) The **Venosus Group**. Our recent studies on the genus have revealed presence of two new species in the last species group. Morphology of the species group studied both qualitatively and quantitatively using linear metric data of pronotum, tegmina and hind femur, and geometric data of male cerci and ovipositor. Morphological data were accompanied by data obtained from male calling song. Morphological and song data were produced from six different populations from North and Eastern part of Turkey: (1) Hakkari, (2) Tendürek, (3) Giresun, (4) Artvin, (5) Kars and (6) Ağrı. Qualitative and quantitative morphology, either linear-metric or geometric, suggest last three population as members of the same unit, but each of other three as different units. Song data are also largely in support of the morphological results. Necessary illustrations were provided to document results visually. Following conclusions were made: (1) the Artvin, Kars and Ağrı populations represent typical *P. venosus* and the Giresun population *P. rugulosus*, (2) each of the Hakkari and Tendürek populations represents a new species and *P. hakkari* sp. n. and *P. tendurek* sp. n. described by comparing with other members of *P. venosus* group, (3) *P. rugulosus*, *P. hakkari* sp. n. and *P. tendurek* sp. n. differ from *P. venosus* mainly by the longer cerci (extend to or beyond end of abdomen) and indistinct tubercles on surface of pronotal disc in female. *P. rugulosus* and *P. tendurek* sp. n. are also similar by sharing presence of two loud elements in a syllable (one in *P. venosus*, song of *P. hakkari* sp. n. is not available). But, similarities in phenotype are in conflict with relationships suggested by genetic data.

**Key words:** Caucasus, Anatolia, *Psorodonotus*, **Venosus Group**, *P. hakkari* sp. n. and *P. tendurek* sp. n.

### **Introduction**

*Psorodonotus* (Orthoptera, Tettigoniidae) established by Carolus Brunner (Brunner, 1861) to include three species, a new species described at that time (*P. pancici*) and previously known two species (*Peltastes venosus* Fischer de Waldheim, 1839 and *Pterolepis fieberi* (Fydvaldsky) Fieber, 1853). Some other existing species such as *Peltastes specularis*, *Peltastes hastatus* (Fischer de Waldheim, 1839) and *Pterolepis caucasica* (Fischer de Waldheim, 1846) were later transferred to this genus (Caudell 1908; Ebner 1923). The first revision of the genus was by Ebner (1923), but several points about genus made clear by Ramme (1951) in his study named as “superrevision”. Ramme (1951) listed 9 species grouped according to their distribution; *P. specularis* (Fischer de Waldheim, 1839), *P. specularis inermis* Ramme, 1951, *P. inflatus* Uvarov, 1912, *P. venosus* (Fischer de Waldheim, 1839), *P. brunneri* Stshelkanovtzev, 1914, *P. caucasicus* (Fischer de Waldheim, 1846) from Caucasus and *P. fieberi* (Fieber, 1853), *P. macedonicus* Ramme, 1931 and *P. illyricus* Ebner, 1923 from Balkans. Karabağ (1952, 1956) described three additional species; *P. anatolicus*, *P. ebneri* and *P. rugulosus*, the first two from western Anatolia and the last from northeast Anatolia. Later, Stolyarov (1983) presented a revision of *P. venosus* by adding two new subspecies. Very recently Ünal (2013) described two new species from Turkey. In OSF (Eades et al. 2013) 11 species were listed, three of which are polytypic.

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