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Short notes

Karyotypes of six previously unstudied European mealybugs (Homoptera: Pseudococcidae)

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Abstract. *Phenacoccus peruvianus* Granada de Willink, 2007, *Ph.* prope *avenae* Borchsenius, 1949, *Ph. hordei* (Lindeman, 1886), *Balanococcus boratynskii* Williams, 1962, *Trionymus radicum* (Newstead, 1895), *Rhizoecus halophilus* (Hardy, 1868) were studied karyologically for the first time. All species demonstrate 2n=10 and a Lecanoid genetic system. Photos of karyotypes of all studied species are given.

Key words: mealybugs, scale insects, karyotype, chromosome number.

By now, only 117 species of mealybugs, that is about 5 % of the world fauna of the family Pseudococcidae, have been studied cytogenetically (see catalogue of Gavrilov, 2007; Gavrilov, Trapeznikova, 2007). Here, we present the karyotypes of 6 further mealybug species, collected in recent years in Portugal, Bulgaria and Russia. All species demonstrate a Lecanoid genetic system characteristic of most Pseudococcidae species (Nur, 1980; Nur et al., 1987; Gavrilov, 2007). Once males display this system, they are diploid, one haploid set of chromosomes being heterochromatinized in most cells (see Figs 2, 5, 7).

Chromosomal preparations were performed as previously described (Gavrilov, Trapeznikova, 2007, 2008). All material is deposited at the Zoological Institute, Russian Academy of Sciences.

Phenacoccus peruvianus Granada de Willink, 2007 (Fig. 1)

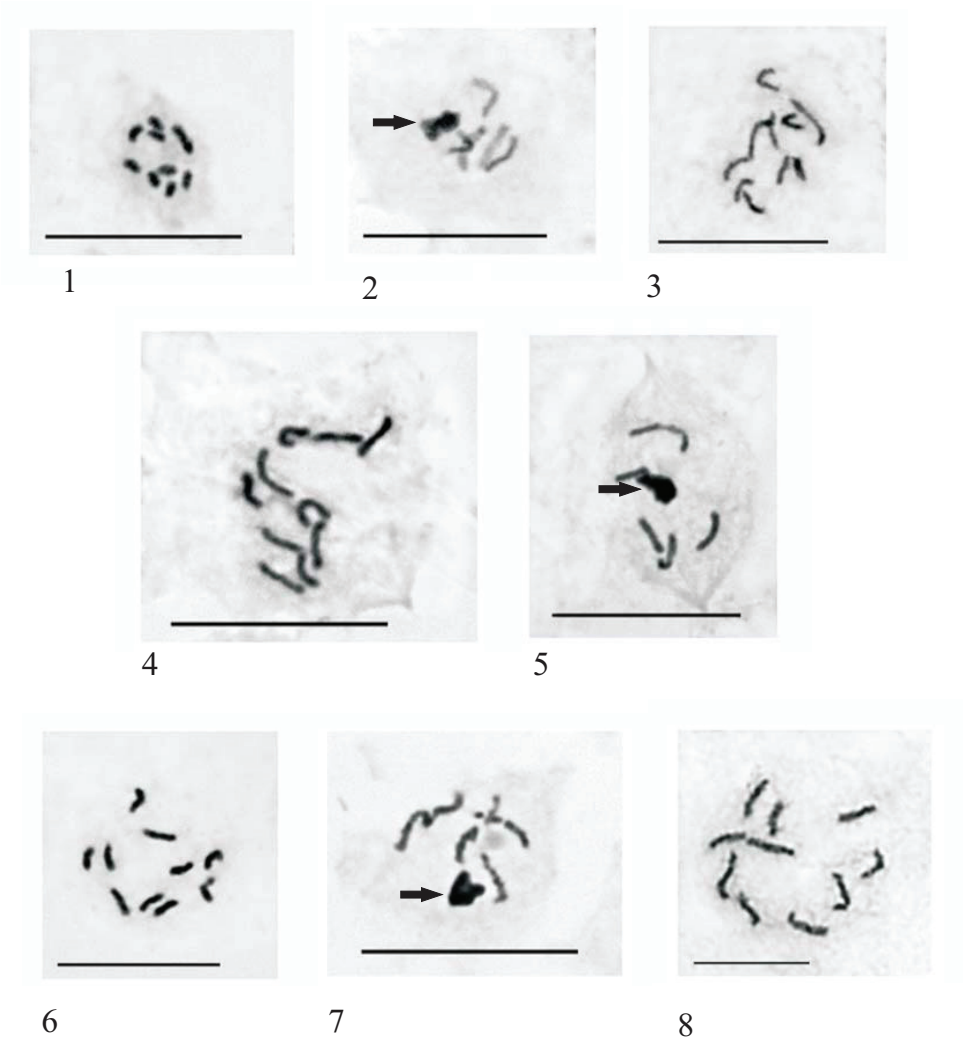
Material. К № 550, Portugal, Lisboa vicinity, *Pittosporum* sp., 26.IX.2007, I. Gavrilov.

Embryos from female body. 2n=10.

Phenacoccus prope ***avenae*** Borchsenius, 1949 (Fig. 2)

Material. К № 555, Portugal, Lisboa vicinity, undetermined bush, 27.IX.2007, I. Gavrilov.

Embryos from female body. 2n=10.



Figs 1-8. Karyotypes of six mealybug species. **1** - *Phenacoccus peruvianus*, female embryonic cell. **2** - *Ph.* prope *avenae*, female embryonic cell. **3** - *Ph. hordei*, female embryonic cell. **4-5** - *Balanococcus boratynskii*; **4** - female embryonic cell, **5** - male embryonic cell. **6-7** - *Trionymus radicum*; **6** - female embryonic cell, **7** - male embryonic cell. **8** - *Rhizoecus halophilus*, female embryonic cell. Arrows indicate a heterochromatinized haploid set of chromosomes. Bar = 10 μm.

Phenacoccus hordei (Lindeman, 1886) (Fig. 3)

Material. M № 1, Russia, Belgorod province, Gubkin, under the leaf sheaths of *Poa* sp., 1.VI.2007, I. Trapeznikova. M № 2, Belgorod province, Valuiki, 2.VI.2007. M № 9, the same, but Bir'uch, 14.VI.2007. M № 13, Belgorod province, 30 km S Bir'uch, 6.VII.2007. M № 30, Belgorod province, Novii Oskol, 8.VII.2008. M № 31, Belgorod province, Alekseevka, 9.VII.2008.

Embryos from the female body. 2n=10.

Balanococcus boratynskii Williams, 1962 (Figs 4-5)

Material. K № 572, Bulgary, Vitoscha mt., alpine zone, under the leaf sheath of undetermined grass, 6.VII.2008, I. Gavrilov.

Embryos from the female body. 2n=10.

Comments. The second cytogenetically studied species of the genus, after *B. singularis* (Schmutterer, 1952) (Gavrilov, 2007; Gavrilov, Trapeznikova, 2007).

Trionymus radicum (Newstead, 1895) (Figs 6-7)

Material. K № 573, 574, 575, Bulgary, Rila mts., Yastrebets, 2300 m, under the leaf sheaths of undetermined grass, 09.VII.2008, I. Gavrilov. K № 576, Bulgary, Rila mts., Yastrebets, 2300 m, on steams of *Dianthus* sp., 9.VII.2008, I. Gavrilov.

Embryos from female body. 2n=10.

Comments. The genus *Trionymus* Berg, 1899 provides a good possibility for karyotaxonomic conclusions. Gavrilov (2004, 2007) and Gavrilov and Trapeznikova, 2007 have shown that the type species of the genus, *T. perrisii* (Signoret, 1875), and also *T. aberrans* Goux, 1938 and *T. haancheni* (McKenzie, 1960) have 2n=16 and bear similarity in morphology. On the other hand, the species that are not very similar in morphology to the type species, demonstrate different chromosome numbers. For example, *T. multivorus* (Kiritshenko, 1936) having 2n=10 was transferred to the genus *Dysmicoccus* Ferris, 1950 (Gavrilov, 2004). Similarly, *T. radicum* has 2n=10 and tubular ducts with collars inherent in the genus *Balanococcus* Williams, 1962 arguing for the transferring this species to the genus *Balanococcus*.

Rhizoecus halophilus (Hardy, 1868) (Fig. 8)

Material. K № 578, Bulgary, Rila mts., the road to Musalka mt. near Musala lakes, ≈ 2300 m, on thin roots of undetermined grass, 11.VII.2008, I. Gavrilov.

Embryos from ovisacs. 2n=10.

Comments. To date, the karyotypes of 4 species of the genus *Rhizoecus* Künckel d'Herculais, 1878, with chromosome numbers 2n=8, 2n=10 and 2n=12, have been reported (McKenzie, 1967; Nur et al., 1987; Gavrilov, 2004). *Rh. halophilus*, studied here, has the same chromosome number as in *Rh. mayanus* (Hambleton, 1946).

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