REDESCRIPTION OF FOUR SPECIES OF THE GENUS *TYROPHAGUS* (ACARI: ACARIDAE) FROM WESTERN IRAN

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ABSTRACT: We redescribe four species of the genus *Tyrophagus* Oudemans (Acari: Acaridae): *T. longior* (Gervais), *T. similis* Volgin, *T. vanheurni* Oudemans and *T. neiswanderi* Johnston and Bruce, collected from the forest soil and tree litter in Hamedan province, Western Iran. We note minor differences between our specimens and other published descriptions of these species.

KEY WORDS: Mites, Sarcoptiformes, *Tyrophagus*, redescriptions, Iran.

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INTRODUCTION

The family Acaridae (Acari: Sarcoptiformes) is an ecologically diverse and cosmopolitan group that includes more than 90 genera and about 400 described species (OConnor 2009; Fan and Zhang 2007). The cosmopolitan genus *Tyrophagus* (with 35 valid species) was erected by Oudemans, 1924 with *Acarus putrescentiae* Schrank, 1781 as its type species (Fan and Zhang 2007). Most species of this genus are fungivorous. They are also commonly associated with stored products and have a substantial economic impact (Hughes 1976; Fan and Zhang 2007). Eight species of *Tyrophagus* have been recorded in Iran (Khanjani et al. 2000; Kamali et al. 2001; Hadad Iraninezhad et al. 2007; Lotfollahi et al. 2010). Namely, *T. brevricrinatus* Robertson, 1959; *T. longior* (Gervais, 1844); *T. neiswanderi* Johnston and Bruce, 1965; *T. vanheurni* Oudemans, 1924 [=*T. palmarum* Oudemans; sensu Robertson, 1959 (Fan and Zhang 2007)]; *T. perniciosus* Zachvatkin 1941; *T. putrescentiae* (Schrank, 1781); *T. similis* Volgin 1949; *T. zachvatkini* Volgin 1948. In this paper, four species of *Tyrophagus* collected in the forested areas of Hamedan province, Western Iran are redescribed and illustrated. We also compare our specimens with those reported from New Zealand and other regions (Fan and Zhang, 2007). This manuscript also gives a key to females of the genus *Tyrophagus* from Iran.

MATERIAL AND METHODS

Specimens were collected from soil and forest litter. The mites were mounted in Hoyer’s medium on microscope slides. Slides were dried in an oven (50 °C), sealed with an industrial painting material, and examined under an Olympus BX51 Differential Interference Contrast (DIC) microscope. Drawings were made with a camera lucida and all measurements are presented in micrometers (μm). The terminology and abbreviations follow that of Griffiths et al. (1990) for idiosomal chaetotaxy; Grandjean (1939) for leg chaetotaxy; and Klimov and OConnor (2003) for organotaxy.

SYSTEMATICS

**Acaridae Latreille, 1802**

**Tyrophagus Oudemans, 1924: 250**

Type species: *Acarus putrescentiae* Schrank, 1781

**Tyrophagus longior** (Gervais, 1844): 262

Diagnosis. Eyespots absent; scx slender, tapering from base to tip; ratio: \(d_{1}/c_{1} 1.46–1.50\); \(d_{1}/d_{2} 1.34–1.35\); \(d_{2}/c_{1} 1.10\); coxal plates I triangular; coxal plates II triangular with posterior margin slightly sinuous; spermathecal duct broad, widening gradually from midway to base of spermathecal sac; solenidion \(\omega_{1}\) and \(\omega\) of legs I–II slender and cylindrical and tapered distally; tarsus IV with setae \(w\) and \(r\) filiform.

**Female** (Figs. 1–12, 60, 65, 70, 75, 80, 85, 90, 95; \(n=7\)). Idiosoma oval. Length of body, including gnathosoma, 519–563, excluding gnathosoma 437–480; width 250–288.

**Dorsum** (Figs. 1–4, 60, 65). Prodorsal shield punctate, with two pairs of setae (\(v_{i}\) and \(v_{e}\)) almost pentagonal, with lateral margins slightly concave; 82–88 long, 97–102 wide between setae \(v_{e}–v_{e}\). Eyespots absent (Figs. 1, 4); basal lobe of Grandjean’s organ with one large tooth and three small teeth, 15–20, 12–13, 5 and 2 long, respectively (Fig. 3). Supracoxal seta scx slender, tapering from


