Chapter 7

Systematics of the genus *Punctodera*

History

Skarbilovich (1959) placed the spherical and pear-shaped species of *Heterodera* in the subgenus *Globodera* and the lemon-shaped species in the subgenus *Heterodera*. After careful consideration of the morphological and biological differences of the females, cysts, and males, Mulvey and Stone (1976) proposed that *Globodera* be raised to generic rank and described a new genus *Punctodera* from the specific epithet of the type species name (Latin *punctum* = dot, and Greek (*δερος*) deros = skin), for species having extensive anal fenestration. An identification key for *Punctodera* was given by Golden (1986).

Genus *Punctodera* Mulvey & Stone, 1976

**DIAGNOSIS** (after Siddiqi, 2000)

*Mature female and cyst*: Spherical, pear-shaped or ovoid, with short projecting neck and heavy subcrystalline layer. Cuticle reticulate, subcuticle with punctations. D-layer present. Terminal region not cone-shaped; cyst light to dark brown. Vulval slit extremely short (<5 μm), anus at a short distance from vulval fenestra. Circumfenestrate, fenestra surrounding vulva 16-40 μm (ca 20 μm in type species) in diam., anus offset toward ventral margin of fenestra, an anal fenestra of similar shape and size to vulval fenestra present. Underbridge and perineal papilla-like tubercles absent. Bullae present or absent. Egg retained in body, no egg sac. **Male**: Vermiform, less than 1.5 mm long. DGO 2.6-4.6 μm. Spicules 31-33 μm long, distally pointed. Tail less than 0.5 anal body diam. long, cloacal lips not forming a tube. **J2**: Body 0.35-0.49 mm, stylet 24-26 μm and tail conical, 63-78 μm long, hyaline region in type species 38-41 μm long. Lateral field with four incisures. Pharyngeal
glands filling body diam. Phasmid openings punctiform, without a lens-like structure. Parasites of monocotyledonous plants.

**TYPE SPECIES**

   = *Heterodera punctata* Thorne, 1928
   = *Heterodera* (*Globodera*) *punctata* (Thorne, 1928) Skarbilovich, 1959

**OTHER SPECIES**

2. *P. chalcoensis* Stone, Sosa Moss & Mulvey, 1976

**Key to species of the genus *Punctodera***

1 – Cyst pear- or oval-shaped, without bullae, parasitising wheat and grasses ........................................... *P. punctata*
   – Cyst spherical- or subspherical-shaped, with bullae, parasitising maize or grasses ........................................... 2

2 – Bullae small and scattered, parasitising maize in Mexico ........
   .......................................................... *P. chalcoensis*
   – Bullae massive, between vulva and anal fenestra, parasitising grasses in Canada and Europe ................................. 3

3 – Stylet knobs strongly concave anteriorly, hyaline region < 42 μm in J2 ............................................. *P. matadorensis*
   – Stylet knobs flattish to slightly concave anteriorly, hyaline region ≥ 42 μm in J2 ............................................. *P. stonei*

*Punctodera punctata* differs from the closely related *P. matadorensis* and *P. stonei* by cyst shape, absence of bullae and some morphometric characters of the J2, as well as by the ability to infect roots of wheat plants (Table 24). However, some observations revealed that these features might be the subject of intraspecific variation for *P. punctata*. It is likely that the present descriptions of this species have been made from samples containing more than one species. Wouts and Baldwin (1998) believed that five different species can be recognised within the genus *Punctodera*: *P. punctata* from wheat, with short juveniles,