

CHARACTERS DIFFERENTIATING THE GENERA *ZYGOTYLENCHUS*
SIDDIQI, 1963 (SYN. *MESOTYLUS* DE GUIRAN, 1964) AND
PRATYLENCHOIDES WINSLOW, 1958 (NEMATODA:
PRATYLENCHINAE)

BY

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The genera *Zygotylenchus* Siddiqi, 1963 (syn. *Mesotylus* de Guiran, 1964) and *Pratylenchoides* Winslow, 1958 are well separated by the structure of the basal part of the oesophagus. They can also be differentiated by the position and relative length of the oesophageal glands overlapping the intestine.

In 1963, the same new species of nematode was described approximately at the same time in three different publications. The first one (Tobar, 1963) reported it as *Pratylenchoides guevarai* n. sp. while each of the other two dealt with the creation of a new genus to receive this species: Siddiqi (1963) named it *Zygotylenchus browni* n. g., n. sp.; de Guiran (1964) described it under the name of *Mesotylus gallicus* n. g., n. sp. and gave in the same article the description of another species of this genus, *M. taomasinae* n. sp.

The respective dates of publication gave the priority to the description of Tobar (1963) over the two others and to the name *Zygotylenchus* over *Mesotylus*.

In a recent publication Tarjan & Weischer (1965) proposed the synonymy of the genera *Zygotylenchus* and *Mesotylus* with *Pratylenchoides* in which they included the species described under the former genera.

We disagree with this opinion and, as the reasons given for separating these genera do not seem to have been entirely apprehended, we think it necessary to stress again their diagnostic features.

The separation of *Zygotylenchus* (syn. *Mesotylus*) from *Pratylenchoides* was based on the structure of the basal part of the oesophagus. Considering this as a fundamental character, both Siddiqi (1963) and de Guiran (1964) gave a similar description of this structure. For comparing it with that of *Pratylenchoides*, Siddiqi gave the drawing from specimens of *Pratylenchoides crenicauda* while de Guiran referred to the illustration given by T. Goodey (1932) for his description of *Anguillulina obtusa*, renamed *Pratylenchoides crenicauda* by Winslow (1958).

As these reasons do not seem to have been sufficiently convincing, syntypes of *P. crenicauda* were examined and compared again with the specimens of the two known species of *Zygotylenchus*.

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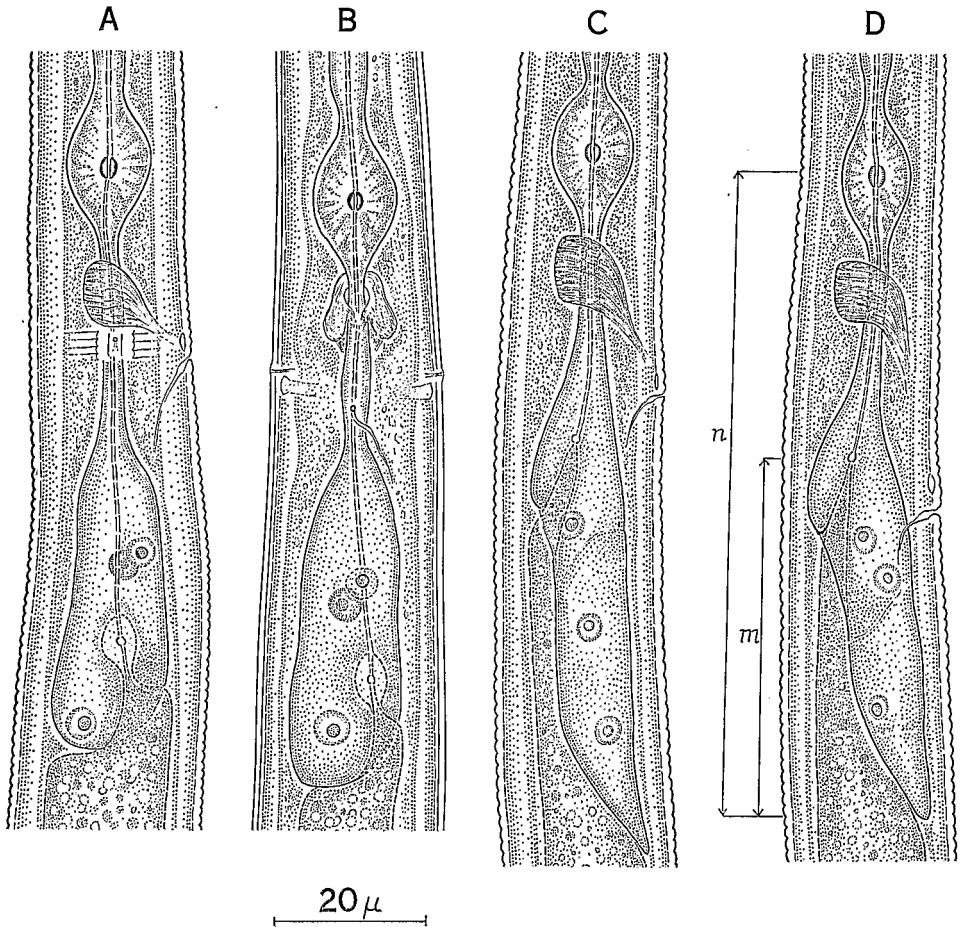


Fig. 1. Structure of the basal part of the oesophagus in the genera *Pratylenchoides* and *Zgotylenchus*. *Pratylenchoides crenicauda*: A: lateral view; B: ventral view. C: *Zgotylenchus guevarai*. D: *Z. taomasinae*.

This confirmed the fact that the organization of the basal part of the oesophagus, especially the junction between the oesophagus and the intestine, is fundamentally different in the two genera as illustrated here in Fig. 1. It can be seen that in *Zgotylenchus* the junction between the oesophagus and the intestine is of the same type as in *Pratylenchus*: viz. the anterior part of the oesophageal glands surrounds the beginning of the intestine before overlapping it ventrally and sub-ventrally. The intestine thus shifts towards the dorsal side, penetrates the anterior parts of the glands, and joins the oesophageal lumen through a small crescent-shaped valvula.

In *Pratylenchoides*, the oesophago-intestinal junction is located in the posterior part of the subcylindrical basal bulb. The intestine is connected with the oesophageal lumen by a large ovoid organ surrounded by the glandular tissue. This

organ has a narrow lumen which is dilated in its middle to form a small refringent valvula. This particular structure has also been observed by Winslow (1958) who says, "a small bulbous structure appears to link the oesophagus and the intestine". About the arrangement of the oesophageal glands he remarks, "It appears to take the form of a 'wrap-round' overlap, completely or almost completely enclosing the alimentary canal". A careful observation of the specimens described by T. Goodey (1932, 1940) as *Anguillulina obtusa*, and designated by Winslow as types of *P. crenicauda* shows that this "bulbous structure" is identical with the ovoid organ described above and can be observed in all well-preserved specimens.

The position of the oesophageal glands with respect to each other is a constant feature in this group and this aspect has not so far been emphasized in the taxonomy of plant-parasitic nematodes. In *Pratylenchoides*, the subventral glands and their nuclei are anterior to the dorsal gland and its nucleus respectively. The subventral glands are also anterior to the oesophago-intestinal junction and it is mostly the dorsal gland that forms an overlap over the front end of the intestine. In *Zygotylenchus*, on the other hand, this condition is just the reverse. All the glands lie posterior to the oesophago-intestinal junction. The subventral glands are posterior to the dorsal gland and form a long, ventral overlap over the intestine.

It is our opinion that these differences justify the separation of these two genera.

It seems that Tarjan & Weischer (1965) could not observe these anatomical details as they say, "the junction of the intestine with the oesophagus was indistinct in many specimens examined". This is confirmed by examining their drawings and could be the reason why they did not recognize the two well separated genera. The same may be said of the drawings given by Tobar (1963) with his description of *Pratylenchoides guevarai*.

Tarjan & Weischer maintain that the ventral or dorsal position of the overlapping glandular lobe is less important in the taxonomy of this group. Comparison of *Z. guevarai* and *Z. taomasinae* with type specimens of *P. crenicauda* shows that the former always have a long glandular lobe overlapping the intestine on its ventral and subventral surfaces. This lobe is comprised mostly of sub-ventral glands. In all the type specimens of *P. crenicauda* examined, this lobe is always located on the dorsal and subdorsal sides of the intestine; it consists mainly of the dorsal gland and is shorter.

Some specimens of *P. crenicauda* show a dorsolaterally situated lobe and some *Zygotylenchus* a lateroventrally, but no *P. crenicauda* has ever been seen with ventrally overlapping glands nor has a *Zygotylenchus* been seen with a dorsally overlapping one. We believe that this character which is important in the taxonomy and is remarkably constant in the other genera of Pratylenchinae can also separate *Zygotylenchus* from *Pratylenchoides*.

Tarjan & Weischer have also discussed the question of the length of the oesophagus and have measured this length on several species of *Pratylenchus* and *Radopholus*, on *Pratylenchoides crenicauda* and on *Zygotylenchus guevarai*. Having

obtained similar results they concluded that this character cannot be taken into account to differentiate these genera.

It is true that the measurements taken, i.e., distance from metacorporal valve to posterior end of the oesophageal glands has in itself no taxonomic value, and could be the same for some Tylenchinae and Criconematinae. The same applies, for instance, to the coefficient 'b': no species and no genera have ever been separated on the basis of this coefficient.

However it is possible to use these measurements to separate *Zygotylenchus* from *Pratylenchoides* if the distance from the oesophago-intestinal junction to the posterior end of the glands (m in Fig. 1 D) is expressed as a percentage of the distance measured by Tarjan and Weischer (n in Fig. 1 D). Thus we can define an "overlapping coefficient". The values of this coefficient are given in Table I for *Pratylenchoides crenicauda*, *Zygotylenchus guevarai* and *Z. taomasinae*.

TABLE I
Overlapping coefficient in Pratylenchoides and Zygotylenchus

Species	Host	Location	Overlapping lobe	Number	Overlapping coefficient mean	Overlapping coefficient % extremes
<i>Pratylenchoides crenicauda</i> (syntypes)	turf	Winches Farm St Albans G.B.	dorsal	10	19,3	13-27
<i>Zygotylenchus guevarai</i>	lettuce	Antibes France	ventral	10	58,8	53-63
<i>Zygotylenchus taomasinae</i> (paratypes)	banana	Tamatave Madagascar	ventral	10	60,3	55-70

The two species of *Zygotylenchus* with overlapping coefficients of about 60% can easily be separated from *Pratylenchoides crenicauda* with an overlapping coefficient of about 20%. This also reflects the difference between the types of oesophagi.

The diagnoses and the nomenclature of the two genera can be established as follows *):

PRATYLENCHOIDES WINSLOW, 1958

Diagnosis: Pratylenchinae. Female with ovaries paired, outstretched, opposite

*) A. Coomans, examining this paper for publication in *Nematologica*, warned the authors of a recent article by Braun & Loof (1966) describing *Pratylenchoides laticauda* n. sp. and reestablishing *Zygotylenchus* as a genus distinct from *Pratylenchoides*. In view of the conflicting opinions appearing in the literature, it seems useful to publish this paper with the additions and corrections in the diagnoses and nomenclature made necessary by Braun & Loof's publication.

and vulva submedian in position. Labial region flattened anteriorly, more or less conical; labial sclerotization conspicuous. Spear strong with rounded basal knobs. Glands of oesophagus in the form of a subcylindrical bulb, dorsal gland extending for a short distance over the anterior end of intestine. An ovoid organ linking the intestine with the oesophageal lumen. Female tail subcylindrical, with crenate tip. Male tail slightly arcuate dorsally, completely enveloped by a bursa. Deirids conspicuous. Phasmids located near middle of tail in both sexes. No marked sexual dimorphism. (According to Braun & Loof (1966) the median oesophageal bulb is narrower in the male).

Type species: *Pratylenchoides crenicauda* Winslow, 1958

syn.: *Anguillulina obtusa* in Goodey 1932 and 1940

Rotylenchus obtusus Filipjev & Schuurmans-Stekhoven, 1941

nec *Tylenchus obtusus* Bastian, 1865

Other species: *Pratylenchoides laticauda* Braun & Loof, 1966

(*Pratylenchoides gadeai* Arias, Jimenez & Lopez, 1965 is a species of *Tylenchorhynchus* according to Braun & Loof, 1966).

ZYGOTYLENCHUS SIDDIQI, 1963

syn.: *Mesotylus* de Guiran, 1964

Diagnosis: Pratylenchinae. Female with ovaries paired, outstretched, opposite and vulva in submedian position. Labial region flattened anteriorly, more or less conical. Labial sclerotization conspicuous. Spear strong, with rounded basal knobs. Oesophageal glands surrounding the beginning of the intestine anteriorly and extending posteriorly as a long lobe on its ventral side. Intestine connected to the oesophageal lumen by a small refringent valvula. Female tail cylindrical, ending in a smooth tip, more or less rounded. Male tail tapering to a pointed terminus, completely enveloped by a bursa. Phasmids located near middle of tail in both sexes. No marked sexual dimorphism.

Type species: *Zygotylenchus guevarai* (Tobar, 1963) Braun & Loof, 1966

syn.: *Pratylenchoides guevarai* Tobar, 1963

Zygotylenchus browni Siddiqi, 1963

Mesotylus gallicus de Guiran, 1964

Other species:

Zygotylenchus taomasinae (de Guiran, 1964) Braun & Loof, 1966

syn.: *Mesotylus taomasinae* de Guiran, 1964

Pratylenchoides taomasinae (de Guiran, 1964) Tarjan & Weischer, 1965.

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RÉSUMÉ

Caractères séparant les genres *Zygotylenchus* Siddiqi, 1963 (syn.: *Mesotylus* de Guiran, 1964) et *Pratylenchoïdes* Winslow, 1958 (Nematoda: *Pratylenchinae*)

Les genres *Zygotylenchus* Siddiqi, 1963 (syn.: *Mesotylus* de Guiran, 1964) et *Pratylenchoïdes* Winslow, 1958 sont très nettement séparés par la structure de la partie basale de l'oesophage. Chez *Zygotylenchus* cette structure est identique à celle rencontrée chez les *Pratylenchus*. Chez *Pratylenchoïdes* la jonction, entre le canal oesophagien et l'intestin se fait par l'intermédiaire d'un organe ovoïde situé dans la partie postérieure de la glande basale.

Ces deux genres sont également séparés par la position, la structure et la longueur du lobe oesophagien recouvrant l'intestin. Chez *Pratylenchoïdes* ce lobe, constitué par la glande oesophagienne dorsale, est situé en position dorsale ou dorsolatérale et son „coefficient de recouvrement” sur l'intestin est de 20%. Chez *Zygotylenchus* il est constitué par les glandes subventrales; sa position est ventrale ou ventrolatérale et son coefficient de recouvrement est de 60%.

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