

**MORPHOLOGICAL VARIATIONS IN *ONCHOCERCA* sp.  
FROM ATYPICAL HOSTS AND SITES :**

**the validity of *O. stilesi***

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**SUMMARY.** Minor morphological variations occur in some specimens of *Onchocerca gutturosa* and *O. lienalis* developing in unusual anatomical sites in their normal hosts and in unusual hosts. These variations may affect characters usually considered to be important diagnostic features. Variations in *O. lienalis* show a range which encompass the features used by Eberhard (1979) to distinguish a new species, *O. stilesi*. Further studies on fresh material are needed before *O. stilesi* can be accepted as a valid species.

**Variations morphologiques de l'espèce *Onchocerca*, chez des hôtes et sites anatomiques inhabituels. Validité de *O. stilesi***

**RÉSUMÉ.** Quelques *Onchocerca gutturosa* et *O. lienalis* peuvent présenter des variations morphologiques mineures lorsqu'ils se développent dans des sites anatomiques ou dans des hôtes inhabituels. Ces variations peuvent affecter des caractères habituellement considérés comme importants pour l'identification des espèces. Les variations présentées par *O. lienalis* s'étendent aux caractères utilisés par Eberhard (1979) pour identifier une nouvelle espèce, *O. stilesi*. De plus amples études de nouveaux spécimens sont nécessaires avant d'accepter *O. stilesi* comme espèce valide.

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**Introduction**

Eberhard (1979) described a new species of *Onchocerca*, *O. stilesi*, from the stifle of cattle slaughtered in an abattoir in Minnesota, USA. Concurrently, in a study on the distribution of *Onchocerca* sp. in the bovine carcass and viscera in Queensland, Australia (Ottley and Moorhouse, 1978a and 1979) four adult *O. lienalis* were found in the xiphisternum of a single animal and these showed similarities to Eberhard's *O. stilesi*. It was also found the host specificity of *Onchocerca* sp. was not high and that *O. gibsoni* may develop in sheep and *O. gutturosa* in horses (Ottley and Moorhouse, 1978b). Accordingly investigations have been made into the possible effects on morphology of worms which develop in atypical anatomical sites and in unusual hosts and hence into the validity of Eberhard's new species.

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## Materials and Methods

The longitudinally bisected nuchal ligaments of 200 fore-quarters and 20 entire carcasses of water buffaloes, *Bubalus bubalis*, from two Northern Territory abattoirs were examined for *Onchocerca* sp. The carcasses were all of mature feral animals from various parts of the flood-plain region of the Territory. Five of the ligaments were infected with worms: three with single non-gravid females and two with a gravid female and mature male in each. These worms were dissected free and processed as described by Ottley and Moorhouse (1979).

The collection and treatment of the material obtained from horses, cattle and sheep has been described (Ottley and Moorhouse, 1978a and b; 1979).

## Results

### Worms from buffaloes

Morphologically the female worms from the buffalo showed the cuticular ornamentation typical of *O. gutturosa*. The tails of four of the females were also typical of this species, but one was longer than normal and terminally expanded. None of the seven heads of these worms exhibited a pronounced guttural dilatation and the expansion of the body at the level of the vagina was frequently the same as that of the nerve ring.

### Worms from horses

Two species, *O. cervicalis* and *O. gutturosa* were found in Queensland horses (Ottley and Moorhouse, 1978b). The equine *O. gutturosa* were similar to those from the bovine as described by Bain (1975) and Ottley and Moorhouse (1979).

However, the head of one otherwise typical adult female *O. gutturosa* was unusual, having an apparently softer, folded cuticle and lacking a characteristically well-defined guttural dilatation.

### Worms from the xiphisternum of cattle

The four specimens of *O. lienalis* recovered showed variation from the typical morphology of this species as described by Bain *et al.* (1978) and Ottley and Moorhouse (1979). In relation to body width the oesophagus was wider than normal, and the cuticular ridges along some parts of the worms were more prominent than normal. The important features of head and tail shape and overall cuticular ornamentation were typical of *O. lienalis*. One of the three female worms did not display any noticeable expansion of the terminal part of the body; this was present in the others.

## Discussion

These results show that minor morphological variations occur in some specimens of *Onchocerca* sp. developing in unusual sites, or in atypical hosts. This is illustrated by the marked reduction seen here in the guttural dilatation in some specimens of *O. guttuurosa* from both horses and buffaloes and previously noted in buffaloes by Chauhan and Pande (1978). This guttural dilatation is usually regarded as one of the most important diagnostic features of *O. guttuurosa* (Sandground, 1934).

These observed variations must open to question the validity of *O. stilesi* which Eberhard (1979) distinguished from *O. lienalis* on the basis of its anatomical location and on minor morphological differences.

Eberhard (*loc. cit.*) described the posterior end of *O. lienalis* as being enlarged or "swollen", and stated that this enlargement was absent in *O. stilesi*. In the present work, three of nine female *O. lienalis* from the gastro-splenic ligament and one of three from the xiphisternum did not feature any marked increase in body diameter posteriorly. However, the shape of the anterior extremity, the tail and the cuticular morphology of most parts of the worms indicate that these specimens were definitely *O. lienalis*. The prominence of the cuticular ridges varies along the length of typical specimens of *O. lienalis*, and in some areas these ridges may appear similar to those of *O. stilesi*.

Eberhard (*loc. cit.*) described the oesophagus of *O. lienalis* as being muscular throughout, while the posterior part of the oesophagus of *O. stilesi* was glandular. The present study of typical *O. lienalis* from the gastrosplenic ligament shows that the posterior oesophagus is glandular not muscular and that it expands markedly posterior to the nerve ring as described for *O. stilesi*.

This opens to question other diagnostic characteristics used in the creation of Eberhard's new species. Unfortunately, no illustration of the entire posterior end of a female *O. stilesi* is included in his description. However it suggests that the tail of *O. stilesi*, like the head, is apparently similar to that of *O. lienalis*. While none of the Queensland worms exhibited cuticle as thick as that of *O. stilesi*, the relationship of ridge height to cuticle thickness (Ottley and Moorhouse, 1979) of the xiphisternum specimens is similar to that recorded by Eberhard.

The similarity of the stifle worms described by Eberhard and the xiphisternum worms found in the present study indicate the need for further study of fresh specimens of both adults and microfilariae before *O. stilesi* can be accepted as a valid species.

If indeed *O. stilesi* proves to be a valid species, then its apparent restricted geographical distribution poses some interesting questions. As cattle are not indigenous to America (Ensminger, 1960), it must be assumed that the worm occurs either in an as yet undiscovered population in Europe, Asia and/or Africa, or that it is normally a parasite of indigenous North American mammals, such as the *Onchocerca* sp. of Williams (1958).

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