supernatants were separately mixed with chloroform (1 : 3) and aqueous layer concentrated *in vacuo*.

For bound amino acids the residual tissue was hydrolysed with 7% sulphuric acid for 24 hr at room temperature. The mixture was filtered and dried under reduced pressure. Both free and bound amino acid fractions were dissolved in 50% ethanol before application

The isolated fractions were separately applied on Whatman No. 1 filter paper strips along with 21 reference standard amino acids by using *n*-butanol–acetic acid–water; 60 : 20 : 20 in one dimension and phenol–acetic acid–water; 74 : 1 : 19·2 in the second dimension. Chromatograms were developed at 90° C for 5 min after spraying with 0·25% (wt./vol.) ninhydrin in acetone. The ninhydrin positive spots were eluted[5-7] in 90% ethanol and read in Spectronic 20 (Bausch & Lomb) colorimeter at 400 nm. Different amino acids were identified with reference to authentic samples of amino acids.

The maximum (8·0) growth index was observed in six weeks old tissue rather than three weeks old tissue (4·0). Eleven free and ten bound amino acids were detected; of them one remained unidentified (Rf 0·7). The total amino acid concentration was more in six weeks old cultures (Table I). Glutamic acid in free form and arginine in bound form were comparatively higher in concentration whereas leucine and serine had lower concentration. Arginine only in bound form and lysine and valine in free form were present.

Tulecke and Rutner[10] have reported that the presence of amino acids in the tissue was due to biochemical reactions at the cell surface whereas Khanna and Jain[7] and Khanna and Nag[5] reported it to be due to biochemical reaction and preferential synthesis of particular amino acid under the described conditions of cultivation of tissues. The latter view also suggests that the concentration of amino acids varies with the type and age of tissue. The wide variation in the individual and total amino acid content can be attributed to the biosynthesis of other primary and secondary products during the growth of the tissue.

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TABLE I

Amino acid composition of Ephedra foliata *Boiss., suspension cultures*

Amino acid	Concentration (mg/g.d.w.)[a]			
	(Three weeks old)		(Six weeks old)	
	Free	Bound	Free	Bound
L-Alanine	0·62	0·35	0·90	0·83
L-Arginine	..	1·15	..	3·00
L-Aspartic acid	3·00	0·68	7·04	2·50
L-Cystine	1·94	1·74	1·20	2·94
L-Glutamic acid	1·13	0·85	7·57	2·04
Glycine	0·17	0·42	0·76	0·45
L-Leucine	1·38	0·73	0·42	0·33
L-Lycine	1·10	..	1·14	..
L-Phenylalanine	1·75	0·45	0·90	2·65
L-Serine	0·10	0·10	0·45	0·21
L-Valine	0·38	..	0·53	..
TOTAL	11·57	6·47	20·91	14·95

[a] Milligram per gram dry weight (Data based on 5 chromatographs of each sample).

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1. Chan, W. N. and Staba, E. J., *Lloydia*, 1965, **28**, 55.
2. Khanna, P. and Nag, T. N., *Ind. J. Pharm.*, 1972, **34**, 42.
3. Sairam, T. V. and Khanna, P., *Lloydia*, 1971, **34**, 170.
4. Staba, E. J. and Jindra, A., *J. Pharm. Sci.*, 1968, **57**, 701.
5. Khanna, P. and Nag, T. N., *Ind. J. Exptl. Biol.*, 1973, **11**, 310.
6. Tulecke, W., Weinstein, L. H., Rutner, A. and Laurencott, Jr. H. J., *Contr. Boyce Thompson Inst.*, 1962, **21**, 291.
7. Khanna, P. and Jain, S. C., *Ind. J. Pharm.*, 1973, **35**, 63.
8. — and Staba, E. J., *Lloydia*, 1968, **31**, 180.
9. Murashige, T. and Skoog, F., *Physiol. Plantarum*, 1962, **15**, 473.
10. Tulecke. W. and Rutner, A., *Proc. Int. Conf. on Plant Tissue Culture*, McCutchan Publ., Corp., Berkeley, California, 1965, p. 103.

ON THE OCCURRENCE OF THE NEMATODE *ASPICULURIS LAHORICA*

Aspiculuris lahorica Akhtar[1] is recorded for the first time from India. The worms were collected from the colon and the rectum part of the alimentary canal of the mouse, *Mus musculus*, at Jodhpur (Rajasthan).

A. laborica is small, creamish white in colour, covered with thick, transversely striated cuticle. The head bears six small cephalic papillae and a cephalic bulb. A pair of cervical alae start a little behind the head–end and terminate abruptly about the middle of the oesophageal bulb. Narrow lateral alae begin a little behind the termination of cervical alae thus leaving a gap between them.

Measurements

Male (based on 5 specimens): The body is 2·95–3·70 mm long and 0·19–0·20 mm in maximum width. Cephalic bulb is 0·13×0·09 mm in diameter. the cervical alae 0·32–0·38 mm long. The oesophagus, excluding the bulb is 0·22–0·25 mm long and 0·04–0·05 mm wide. The oesophageal bulb is 0·08–0·09× 0·07–0·08 mm in size. The nerve ring and the excretory pore are at 0·13 mm and 0·88–0–93 mm respectively, from the anterior end (Fig. 1).

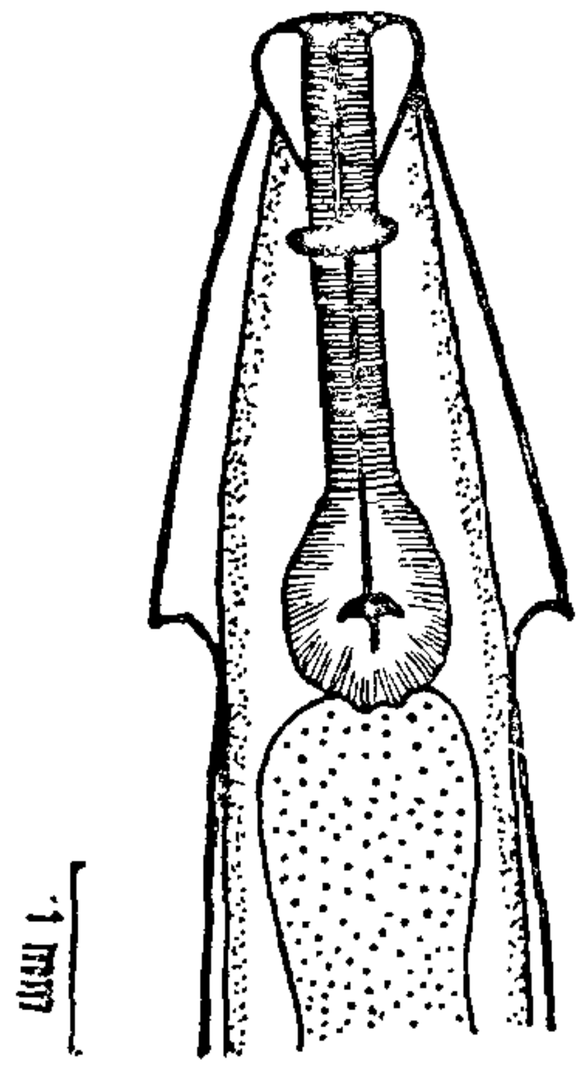

FIG. 1. Anterior end of male from a cleared toto, preparation.

The tail is 0·16 mm long with a blunt apex. There is a pair of caudal alae which extend upto the blunt apex. The caudal papillae are 10 in number—four paired and two odd ones. Of the paired papillae,–the first is preanal, the second adanal, the third post-anal and the fourth situated about the middle of the tail. Out of the two odd papillae situated in median line, the first is a little behind the posterior lip of the cloaca and the other slightly behind the former (Fig. 2).

Female (based on 5 specimens): The body is 5·00–5·40 mm long and 0·30–0·34 mm in maximum width. The cuticular striations are 0·006 mm apart. The cephalic bulb is 0·10×0·11 mm in diameter. Cervical alae are 0·43 mm. in length. The oesophagus without bulb is 0·28–0·30 mm long and 0·04–0·05 mm wide. The oesophageal bulb measures 0·14–0·15 × 0·11–0·13 mm in size. The nerve ring and the excretory pore are located at 0·16–0·18 mm and 1·00–1·14 mm respectively, from the anterior end of the body. The vulva is situated at 2·05–2·41 mm from the anterior end. The eggs are oval, 0·09×0·04 mm in size. The tail is 0·65–0·70 mm long.

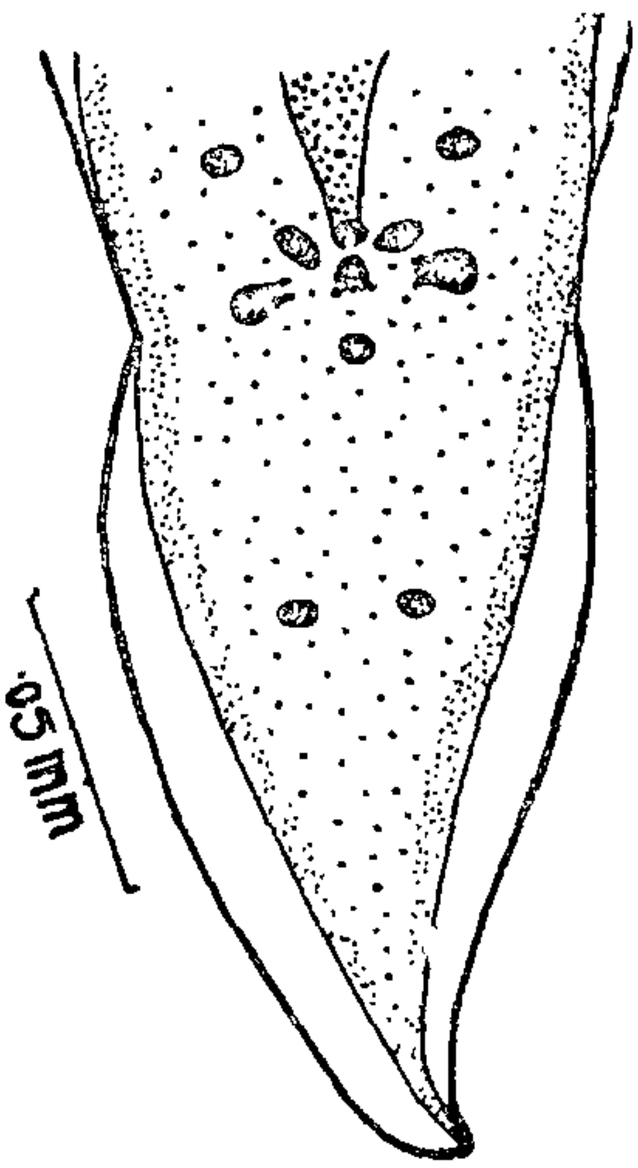

FIG. 2. Posterior end of male (Ventral view) from a cleared toto preparation.

The present specimens closely resemble Akhtar's[1], but differ from this in the location of the excretory pore and the vulva which are much posteriad in comparison to Akhtar's specimens.

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1. Akhtar, S. A., *Pakistan Jour. Sc. Res.*, 1955, 7, 101.