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NEW LOCALITY AND HOST RECORD FOR *SOUTHWELLINA HISPIDA* (VAN CLEAVE, 1925) WITENBERG, 1932 (ACANTHOCEPHALIA : POLYMORPHIDAE) FROM CHILKA, ORISSA, AND A NEW HOST RECORD FOR *SOUTHWELLINA SACRA* N. SP. FROM ANDAMAN

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INTRODUCTION

The polymorphid worms in aquatic and fish-eating birds are reported mostly from Noth. The species of the genera under the family Polymorphidae viz. *Polymorphus; Filicollis; Corynosoma; Arhythmorhnchus; southwellina* etc. have been reported mainly from USSR, USA, and Europe. Some juvenile forms in amphibians and adults in birds have been reported from Japan. Very little is known about the occurrence of the species of these genera in India.

While dealing with the collections, the authors have come across some acanthocephalan parasites from Ichthiophagus birds of Chilka, Orissa and Port Blair, Andaman. The parasites have been identified as Southwellina hispida (Van Cleave, 1925) Witenberg, 1932 from *Haliastur indus* (Brahmini kite) and *Nycticorax nycticorax* (Night heron) at Chilka, and *Southwellina sacra* n.sp. from *Egretta sacra* (Reef heron) at Port Blair, Andaman. *S. hispida* has broad geographical distribution as opined by Van Cleave (1940) while reporting the species in heron from Galápagos Islands.

The description of *Southwellina hispida* with its new locality and new host record as well as that of *Southwellina sacra* n.sp. with its new host record is the subject of this paper. *Arhythmorhynchus tigrinus* Moghe and Das, 1953 from India is considered as a synonym of *S. hispida.*

MATERIAL AND METHOD

The specimens are killed in distilled water to allow the probosces to come out of the peoboscis sheaths. The specimens are then pressed and fixed in 70% alcohol. After fixation and staining in borax carmine, permanent whole mounts on slides are prepared. The specimens are drawn under camera lucida. All the measurements are in mm unless otherwise stated.

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SYSTEMATIC ACCOUNT

Class PALAEACANTHOCEPHALA Meyer, 1931

Order POLYMORPHIDA Petrotschenko, 1958

Family POLYMORPHIDAE Meyer, 1931

Genus ***Southwellina*** Witenberg,, 1932

Key to the Indian species

1. Longitudinal rows of hooks on proboscis 17-24 with *14-17 in each row* ..... *S. hispida (Van Cleave, 1925) Witenberg, 1932 (From N. nycticorax, Haliastur indus and Rana tigrina in India)*

   Longitudinal rows less than 20 2

2. *Longitudinal rows of hooks on probosis14 with 15 hooks in each row* ..... *S. sacra n.sp. (From Egretta sacra, Andaman,* India)

Southwellina hispida (Van Cleave, 1925) Witenberg, 1932

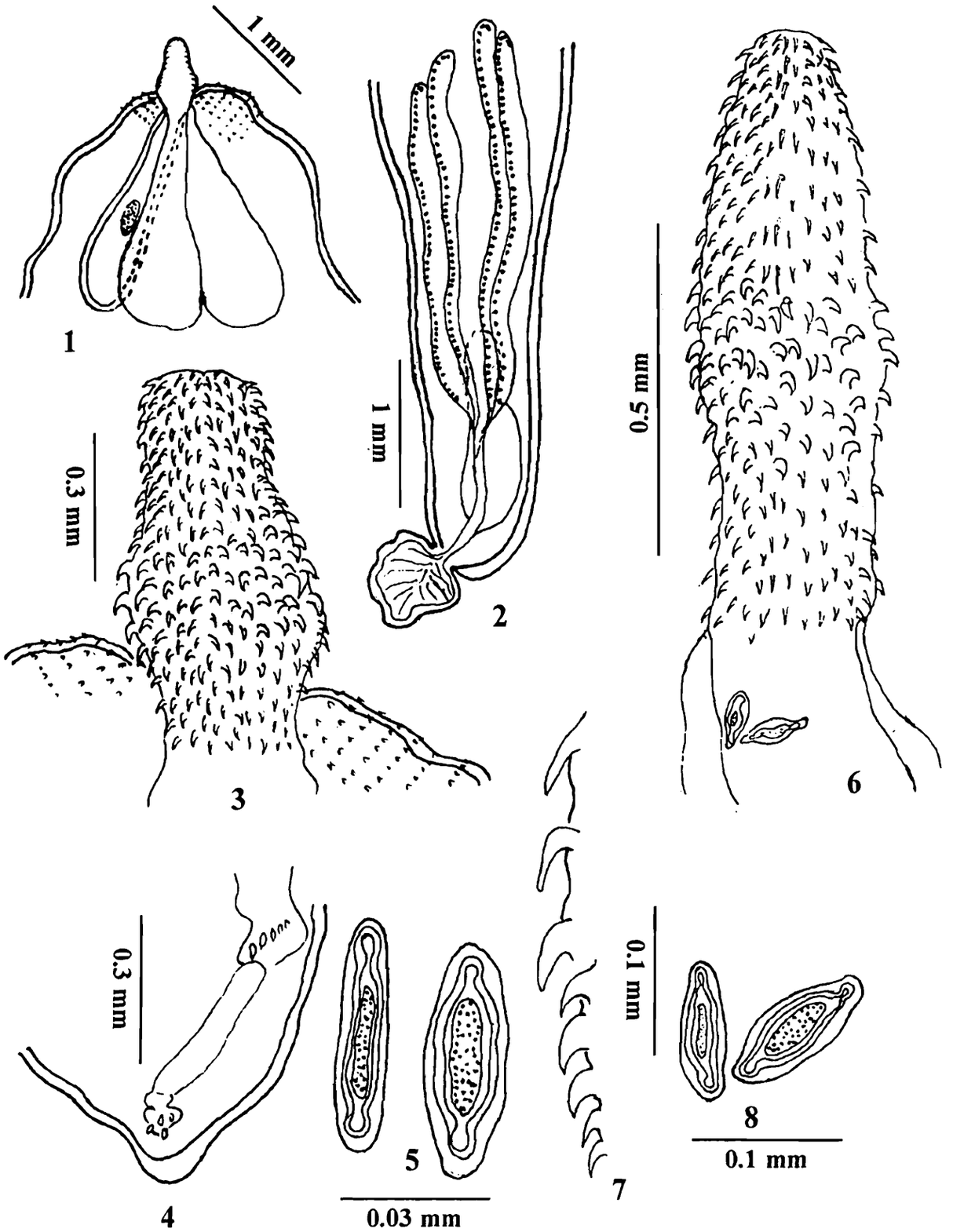
(Plate 1; Fig. 1–8)

Syn. : *Arhythmorhynchus fuscus* Harada, 1929
Arhythmorhynchus duocinctus Chandler, 1935
Arhythmorhynchus tigrinus Moghe and Das, 1953
Polymorphus ardeae Belopolskaia, 1958
Hemiechinosoma ponticum Petrotschenko et Smogorjevskia, 1962

Ref. : Witenberg, G. 1932 : Acanthocephalen Studien ii Bol. Zool. Napoli, 3 : 253-266
Schmidt G. D. 1973 : Resurrection of *Southwellina* Witenberg, 1932 with a description of *Southwellina dimorpha* n.sp. and a key to genera in Polymorphidae (Acanthocephala)

Van Cleave (1925) described *Arhythmorhynchus hispidus*, a juvenile form in frogs of Japan. Fukui (1929) described the adult form of *A. hispidus* in *N. nycticorax* from Japan. Witenberg (1932) proposed a new genus *Southwellina* with its type species *S. hispida* (Van Cleave, 1925). Golvan (1956); Petrotschenko (1958); Yamaguti (1963) rejected the genus *Southwellina* and revalidated *A. hispidus*. Schmidt (1973) resurrected the genus and re-established *S. hispida* (Van Cleave, 1925) Witenberg, 1932. He redefined the genus *Southwellina* and listed *Arhythmorhynchus fuscus* Harada, 1929; *A. duocinctus* Chandler, 1935; *Polymorphus ardeae* Belopolskaia, 1958; and

PLATE 1



Figs.1-8. *Southwellina hispida* (Van Cleave, 1925) Witenberg, 1932 (Figs.1-5 from Haliastur indus; Figs.6-8 from *N.nycticorax).* : 1.Anterior of male; 2. Posterior of male; 3. Proboscis enlarged; 4. Posterior of female; 5. Eggs *(H.indus);* 6. Proboscis enlarged *(N.nycticorax);* 7. Hooks; 8.Eggs *(N.nycticorax).*

Hemiechinosoma ponticum Petrotschenko et al, 1972 as synonyms of *S. hispida*. Later, Amin (1985) justified Schmidt's observation and considered *Southwellina* as a valid genus with type species *S. hispida*.

One male and two female specimens from *H. indus* and three female specimens from *N. nycticorax* at Chilka, Orissa have been recovered. The description of *S. hispida* from *H. indus* is as under :

Description :

Male : Body medium, spinose, anterior trunk broad with hypodermic nuclei, posterior trunk short, narrrow and devoid of spines, trunk spines anterior, minute, sparse, bare zone between the fields not found. Proboscis spindle shaped, swollen at the middle. 20–22 longitudinal rows with 16–17 hooks in each row, 2–3 hooks per row at mid-proboscis stout and broad, hooks gradually increasing in size from tip toward middle of row. pH – 0.0249–0.0498 X 0.0083 (Ant & Post.) 0.0415–0.0498 X 0.0166–0.0249 (mid proboscis) Pr. Root – 0.033–0.066 X 0.0083 (Ant.) 0.066–0.0664 X 0.0166–0.0249 (mid-proboscis). Neck wider than long. Proboscis sheath cylindrical, double walled, ganglion at the centre. Lemnisci leaf-like. Testes two, at braod anterior trunk region, ruptured. Cement gland four, tubular, long. Seminal vescicle long. Cement reservoir long. Bursa protruded.

Female : Body medium, spinose, anterior trunk broad with hypodermic nuclei, posterior trunk short narrow and devoid of spines, trunk spines anterior, minute, sparse, bare zone between the fields not found. Proboscis spindle shaped, swollen at the middle, 20–22 longitudinal rows with 16–17 rows in each row, 2–3 hooks per row at mid proboscis stout and broad. pH as in male. Neck wider than long, Proboscis sheath double walled, with ganglion at the centre. Lemnisci leaf-like. Uterine bell long. Uterus slender, long. Genital pore sub-terminal. Eggs elliptical with prominent polar prolongations of the middle shell.

Other measurements given in the Table 1.

Host : *Haliastur indus* (Brahmini kite)

Nycticorax nycticorax (Night heron)

Location : Intestine

Locality : Chilka, Orissa

Date of Collection : December, 1986

ZSI Reg. No. W 8553/1–W8556/1, Calcutta.

Discussion Schmidt (1973) observed weak and unstable distinguishing boundaries between the species and even more so between the genera of the family Polymorphidae. Therefore, he

Table 1. Comparative chart of measurement of *S. hispida**

	S. hispida (After Fukui, 1929 and Scholz et al, 1992)	*S. hispida* (Chilka, Orissa)	*S. hispida* (Chilka, Orisssa)
Total length	M.5.16-14/1.00-2.11 F.7.65-18/1.00-2.60	F.10.5-12.5/3.00-3.25(Ant.) 1.06-1.2 (Post)	M.14.3/3.12(Ant.)1.65 (Post) F. 13.25-15.6/2.75-3.5 (Ant.) 1.31-1.75 (Post)
Probosdcis	M. 0-62-0.89/0.32-0.43 F.0.77-0.93/0.32-0.39	F.0.94/0.3 (Mid-prob.)	M. 0.8/0.375 (Mid.prob.) F. 0 : 675/0.289 (Mid-prob.)
Probosis hooks	20-24/12-15	20-22/16-17	M. 20-22/16-17 F. 20-22/16-17
Size of hosks	Tip. 52-65/13-18* Mid. 47-62/18-22 Base. 41-59/14-15 *in microns	Tip. 0.0249-0.0498/0.0083 Mid. 0.0415-0.0498/0.0166-0.0249 Base. 0.0249-0.0498/0.0083	Tip. 0.0249-0.0415/0.0083 Mid. 0.0415/0.0249 Base. 0.0249-0.0415/0.0083
Neck	0.49/0.57	0.45/0.575	2.25/0.55
Proboscis Sheath	1.06-1.77/0.39-0.5	0.996/0.332	0.3/0.55
Lemnisci	0.89-1.77/0.24-0.43	1.875/0.625	1.75/0.825
Testes	Ovoid, two T_1.0.52-0.85/0.46-0.67 T_2.0.72-1.00/0.46-0.61	–	Two, ruptured
Cement gland	Four 1.3-2.84	–	Four 4.625-5.875
Eggs	0.088-0.108/0.023-0.035	0.1-0.125/0.025-0.05	0.083-0.099/0.0249-0.033
Trunk spines	Two fields Ant. 0.24-0.32 wide 5-7 rows Post 0.37-0.72 wide 9-12 rows	Spines in anterior trunk, Spines minute, sparse, 2 fields not found	Spines in anterior trunk, minute, sparse, 2 fields not found.
Host	Nycticorax nycticorx & Phalacrocorax carbo	*Nycticorax nycticorax*	*Haliastur indus*
Locality	Japan, Czeckoslovakia	Chilka, Orissa, India	Chilka, Orissa, India

*Measurement in mm unless otherwise stated.

revised the family and suppressed two subfamilies viz. Polymorphinae and Corynosomatinae. He synonymised Filicollidae with Polymorphidae considering 8 genera under the family as valid.

Schmidt (1973) resurrected and redefined the genus *Southwellina* Witenberg, 1932. He accommodated the species bearing anterior trunk spines in two fields in at least in one sex, posterior trunk shorter and four cement glands in the genus. Accordingly, he considered four polymorphid species as synonyms of *S. hispida* and included three species in his key to species. *S. hispida* is the type species for the genus.

With almost all morphological characteristics of the specimens under report correspond with that of *S. hispida* redescribed by Fukui (1929) and Scholz et al. (1992) from Japan and Czechoslovakia respectively. Further, the present specimens conform with *S. hispida* in respect of some dangnostic features such as gradual increase of size of proboscis hooks from tip toward middle of each row, hooks' size not more than 0.065 mm etc. as redefined by Schmidt (1973). The distribution of trunk spines in *S. hispida* does not agree with that of the present form. In this case, the trunk spines are so minute and sparse that two fields of spines cannot be ascertained. Therefore, this feature is considered as an intrspecific variation. Otherwise, it is definite that the specimens belong to the species S. hispida.Hence, the species is redescribed as Southwellina *hispida* (Van Cleave, 1925) Witenberg, 1932 with new locality and new host record in India.

Southwellina sacra n.sp.

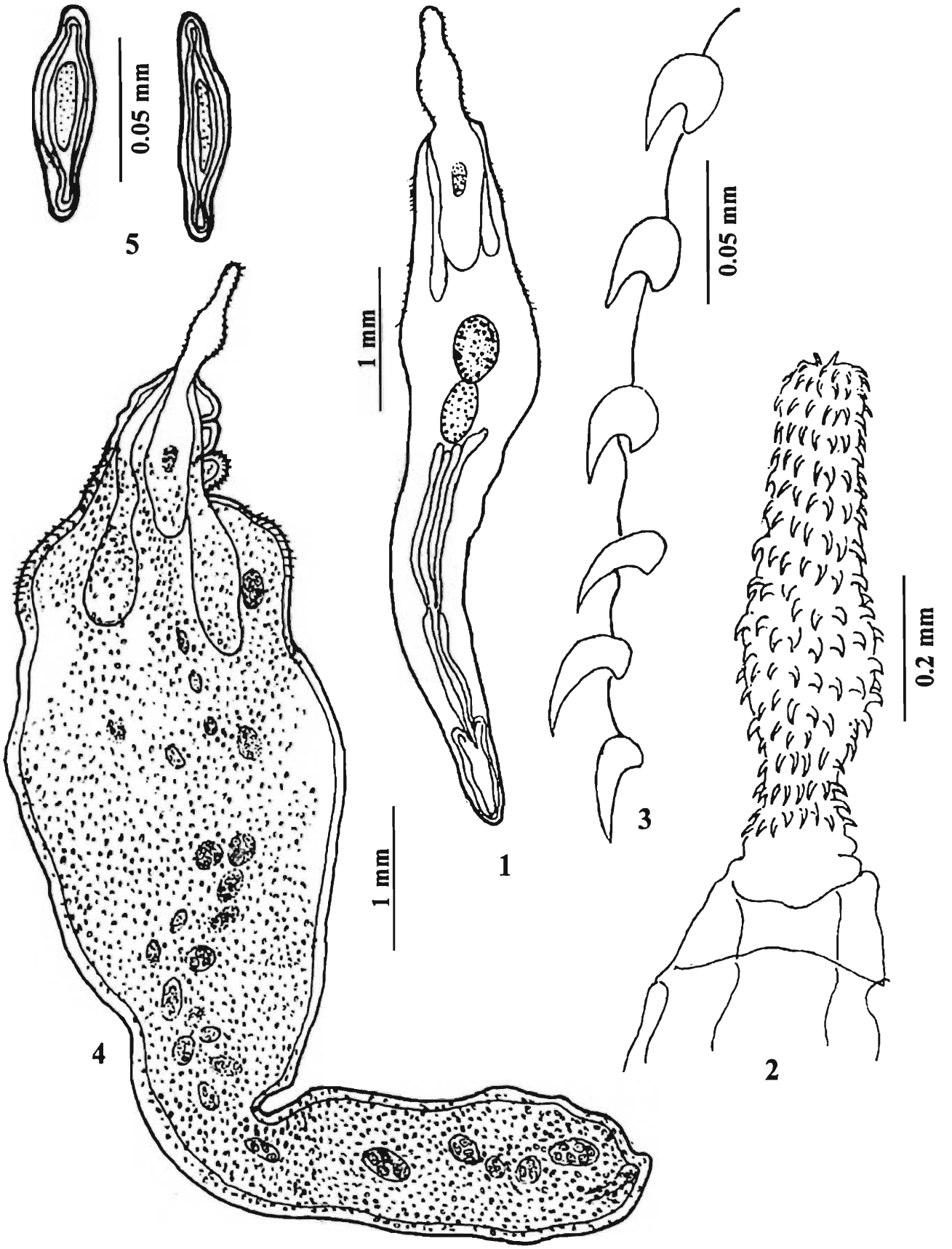
(Plate 2; Figs. 1–5)

Three male and three female specimens are obtained from the intestine of *Egretta sacra* (Reef. heron) from Port Blair, the Andaman. The description is as under :

Description :

Male : Body small, spinose, anterior trunk broad, posterior short, narrow, without spines. Hypodermic nuclei at anterior trunk. Trunk spines in two fields at the broad anterior trunk, 1st. field 0.166–0.182 wide, with 8–10 rows of spines, 2nd. Field 0.248–0.289 wide with 8–12 rows of spines. Proboscis spindle shaped, mid-proboscis broad. Proboscis hooks in 14 longitudinal rows with 15 hooks in each row, 2–3 hooks per row at mid-proboscis stout and broad, hooks gradually increase in size from tip toward middle of row. pH – 0.03–0.036 X 0.004–0.01 (Ant.), 0.036–0.042 X 0.018 (Mid-proboscis), 0.036–0.052 X 0.01–0.012 (Post). Pr. Root 0.02–0.024 X 0.004 (Ant.), 0.036 X 0.008 (Mid-proboscis). Neck short, wider than long, proboscis sheath within broad anterior trunk, double walled, ganglion near centre. Lemnisci leaf like, unequal, Testes two, contiguous, within broad anterior trunk but below the posterior field of trunk spines. Cement gland four, long, tubular, bursa not protruded.

PLATE 2



Figs.1-5. *Southwellina sacra n.sp. : 1. Male; 2. Proboscis enlarged; 3. Hooks; 4. Female; 5.Eggs.*

Female : Body small, spinose, anterior trunk broad, posterior short, narrow, without spines. Hypodermic nuclei at anterior trunk. Trunk spines in two fields at the broad anterior trunk, 1st. field 0.166–0.199 wide with 8–12 rows of spines, 2nd field 0.496–0.512 wide with 8–12 rows of spines. Proboscis spindle shaped, mid-probossic braod, proboscis hooks in 14 longitudinal rows with 15 hooks in each row, 2–3 hooks per row at mid-proboscis stout and broad, hooks gradually increase in size from tip toward middle of row, hook size as in male. Neck wider than long. Proboscis sheath within broad anterior trunk. Lemnisci leaf-like. Body cavity full of eggs with a few ovarian follicles. Eggs elliptical, prominent polar prolongations of the middle shell present. Genital pore sub-terminal.

Other measurements given in the Table 2.

Host : *Egretta sacra* n.sp.

Location : Intestine

Locality : Port Blair, the Andaman

Date of coll : June, 1969

ZSI Reg. No. W8557/1-W 8560/1, Calcutta

Discussion : Schmidt (1973) revalidated *S. hispida* (Van Cleave, 1925) Witenberg, 1932 as the type species of *Southwellina* Witenberg, 1932. He considered only three species as valid viz., *S. dimorpha* Schmidt, 1973 from US; *S. macracantha* (Ward & Winter, 1932} Schmidt, 1973 comb. n. from U.S. and *S. hispida*, circumboreal. Moghe and Das (1953) described *Arhythmorhynchus tigrinus*, a juvenile form in *Rana tigrina* from India which was considered as valid by Yamaguti (1963) but Schmidt (1973) left it out without comments.

Arhythmorhynchus tigrinus Moghe and Das, 1953 has been considered as a synonym of S. *hispida* as discussed below :

The present specimens under study have been compared with all the three existing species under the genus *Southwellina*. The present form basically differs from S. *dimorpha, S. macracantha,* and *S. hispida* in having lowest number of longitudinal rows of proboscis hooks and number of hooks in each row. Secondly, it differs from these species in having shorter length of proboscis hooks and roots. Finally it differs in having less number of rows of trunk spines in both the fields. Table 2 shows the comparison between the Indian species.

The specimens under study have also been compared with its nearest species of the genera viz, *Hexaglandula, Arthythmorhynchus* and *Corynosma* under the family Polymorphidae and have been found that the species is independent of all its nearest allies.

Hence, the authors consider the species as new to science and designate it *Southwellina sacra* n. sp. The new species forms a new record for its locality and host.

Table 2. Comparative chart of measurement of Indian species*.

	S. hispida (From *N. nycticorax* & *Haliastur indus* Chilka, Orissa)	*S. tigrina* (Moghe & Das, 1953) Comb. n. (From Rana tigrina in India)	*S. sacra* n.sp. (From Egretta sacra Port Blair, the Andaman
Total Length	M.14.3/3.12 (Ant.) 1.65 (Post.) F.10.5-15.6/2.75-3.5 (Ant.) 1.06-1.75 (Post)	0.25/0.55	M.4.875/0.75 (Ant.) & 0.27 (Post) F.4.5-5.5/1.00-1.75 (Ant.)
Proboscis	M. 0.182-0.8/0.375 (Mid.Prob.) F.0.675-0.94/0.289-0.3 (Mid prob)	0.7/0.25 (Mid-prob.)	M.0.625-0.696/0.2 (Mid Prob.) F. same as male.
Probosis hooks	20-22/16-17	17-18/14-15	14/15
Size of books	Tip. 0.0249-0.0498/0.0083 Mid. 0.0415-0.0498/0.0116-0.0249 Base.0.0249-0.0498/0.0083	Tip. 0.03 Mid. 0.04 Base 0.03	Tip. 0.03-0.036/0.004-0.01 Mid. 0.036-0.042/0.018 Base 0.036-0.052/0.01-0.012
Neck	0.49/0.57		0.2/0.325
Probosis Sheath	0.3-0.996/0.332-0.55	0.06	0.85/0.225
Lemnisci	1.75-1.875/0.625-0.825	1.00/0.15	L_1-0.75/0.125 L_2-1.05/0.225
Testes	Two, ruptured	T_1-0.15 T_2. 0.15	T_1 – 0.375/0.25 T_2 – 0.347/0.207
Cement glands	Four 4 625-5.875	Number, not given. long, tubular	Four 0.375 long
Eggs	0.083-0.125/0.0249-0.05		0.083-1.00/0.024-0.033
Trunk Spines	Spines in anterior turnk, minute, sparse, 2 fields not found.	2 fields 1st 0.12 wide, 40-44 rows 2nd 0.2 wide, 48-52 rows	M- 2 fields 1st 0.166-0.182 wide, 8-10 rows 2nd 0.248-0.289 wide, 8-12 F-rows 1st 0.166-0.190 wide, 8-12 rows 2nd 0.0496-0.512 wide, 8-12 rows.

*Measurement in mm unless otherwise stated.

Status of ***Arthythmorhynchus tigrinus*** Moghe & Das, 1953

Moghe and Das (1953) described *Arthythmorhynchus tigrinus*, the larval form in frogs, *Rana tigrina* from India. At the same time crow and kite were experimentally fed with the larvae of the species. The authors found positive result in them and established that the final hosts for *Arthythmorhynchus* were birds.

After careful study, it is observed that *A. tigrina* with all its characteristic features fit with that of *S. hispida* (after Schmidt, 1973 and Scholz et al., 1992) except the features viz, number of cement glands and size of eggs (lacking in their description). Other variations such as length of lemnisci, size of proboscis sheath, number of rows of spines in both the fields of the trunk (40-44 rows and 48-52 rows respectively) etc. may be deemed as variation due to juvenility. This number of longitudinal rows of proboscis hooks from tip toward mid-proboscis etc, are very much in agreement with the range of number and size of different organs as found in *S. hispida.*

Having compared the description of *A. tigrinus* with that of juveniles of *S.hispida* and *A.duocinctus,* it is opined that *A.tigrinus* and *S.hispida* are the same species.. Therefore, we propose *A. tigrinus* as a synonym of *S.hispida*. Hence, it is *Southwellina tigrina* (Moghe & Das, 1953) Comb. n.

SUMMARY

The paper deals with redescription of *Southwellina hispida* (Vancleave, 1925) Witenberg, 1932 from *Haliastur indus* (Brahmini kite) and Nycticorax nycticorax{Night heron} at Chilka, Orissa.The former host forms a new host record in India and the latter forms a new locality record. *Arhythmorhynchus tigrinus* Moghe & Das, 1953, a juvenile form in *Rana tigrina* from India has been proposed to be the synonym of *S. hispida* by the present authors. Some parasites collected from *Egretta sacra* (Reef heron) at Port Blair, the Andaman, have also been described as *Southwellina sacra* n.sp. The host, *Egretta sacra* claims to be a new host record for the species.

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