NOTES

NOTES ON THE CHROMOSOMES OF SOME AMPHIBIA

We describe briefly the chromosomes of 7 species of amphibians: Urodela, (*Hynobius nebulosus,* Hynobiidae); Anura, (*Pipa pipa,* Pipidae; *Gastrophryne carolinensis,* Microhylidae; *Kassina wealii,* Hyperoliidae; *Rhacophorus leucomystax* and *Hemisus marmoratus,* Ranidae; *Bufo melanostictus,* Bufonidae). We studied the chromosomes of both sexes of all the above anuran species, except *H. marmoratus,* of which we studied 3 females; none of these showed sex chromosomes. We obtained chromosomes only from a young male *Hynobius.*

Hynobius nebulosus: this species has 2n=56 (Fig. 1a). This is in agreement with Makino (1934) and Sato (1936). The chromosomes can be subdivided into 5 groups depending on their size and form: 1) 9 pairs of large, meta- or submetacentric elements; 2) 3 pairs of medium-size, meta- or submetacentric elements; 3) 6 pairs of small, acrocentric or metacentric elements; 4) 9 pairs of very small, acrocentric elements (microchromosomes); 5) one pair of heteromorphic elements, constituted by one acrocentric chromosome (somewhat larger than the elements of group 3) and by one microchromosome (Fig. 1a, see arrows).

Pipa pipa: this species shows 2n=22 (Fig. 1b). This is in agreement with Wickbom (1950). The thromosomes can be divided into a group of 4 pairs of large elements (all metacentric except the fourth pair, which is subtelocentric), and a group of 7 pairs of very small, acrocentric elements (microchromosomes). In the male line, there are 4 larger and 7 smaller spermatocyte bivalents, with two or one terminal chiasmata, depending on their size (Fig. 1c). The karyotype of *P. pipa,* so different from that of the African pipids, might be related to that of *Protopipa parva* by Robertsonian mechanisms of centric fusion/fission (Morescalchi, 1968a, b).

Gastrophryne carolinensis: this microhylid has 2n = 22, with 6 pairs of larger, meta- or submetacentric chromosomes, and 5 pairs of smaller chromosomes, meta- or submetacentric except the eighth pair, which is acrocentric (Fig. 1d). The karyotype of *G. carolinensis* is not very different from that of the African microhylid *Breviceps gibbosus* (Morescalchi, 1968c).

Kassina wealii: this hyperoliid has 2n=24 (Fig. 1e), with 5 pairs of larger and 7 pairs of slightly smaller, meta- or submetacentric chromosomes. This karyotype is almost equal to that of *Kassina senegalensis,* and very similar to that of some *Hyperolius* with 2n=24 (Morescalchi, 1968c).

Rhacophorus leucomystax: this species has 2n=26 (Fig. 1f), with 5 pairs of larger and 8 pairs of smaller, meta- or submetacentric chromosomes. This karyotype is somewhat similar to that of the ranid *Mantella,* and approaches the constitution typical of some *Hyperolius* with 2n=26 (Morescalchi, 1967; 1968c).

Hemisus marmoratus: this species has 2n=24 (Fig. 1g), with 6 pairs of larger chromosomes (of which 5 are meta- or submetacentric, and the sixth pair is subacrocentric), and 6 pairs of smaller chromosomes, all meta- or submetacentric. The karyotype of this taxonomically problematic species is different from that of many Ranidae, such as many species of *Rana, Mantella, Rhacophorus* and *Pyxicephalus,* while it approaches the karyotype of some karyologically evolved *Rana (R. arvalis)* and of some Microhylidae, such as *Breviceps* and *Gastrophryne.* Ranidae and Microhylidae seem karyologically linked together (Morescalchi, 1968c).

Bufo melanostictus: the karyotype of this species has 22 chromosomes (Fig. 1h), and is similar to that of many *Bufo* (Bogart, 1968; Morescalchi and Gargiulo, 1968): there are 6 pairs

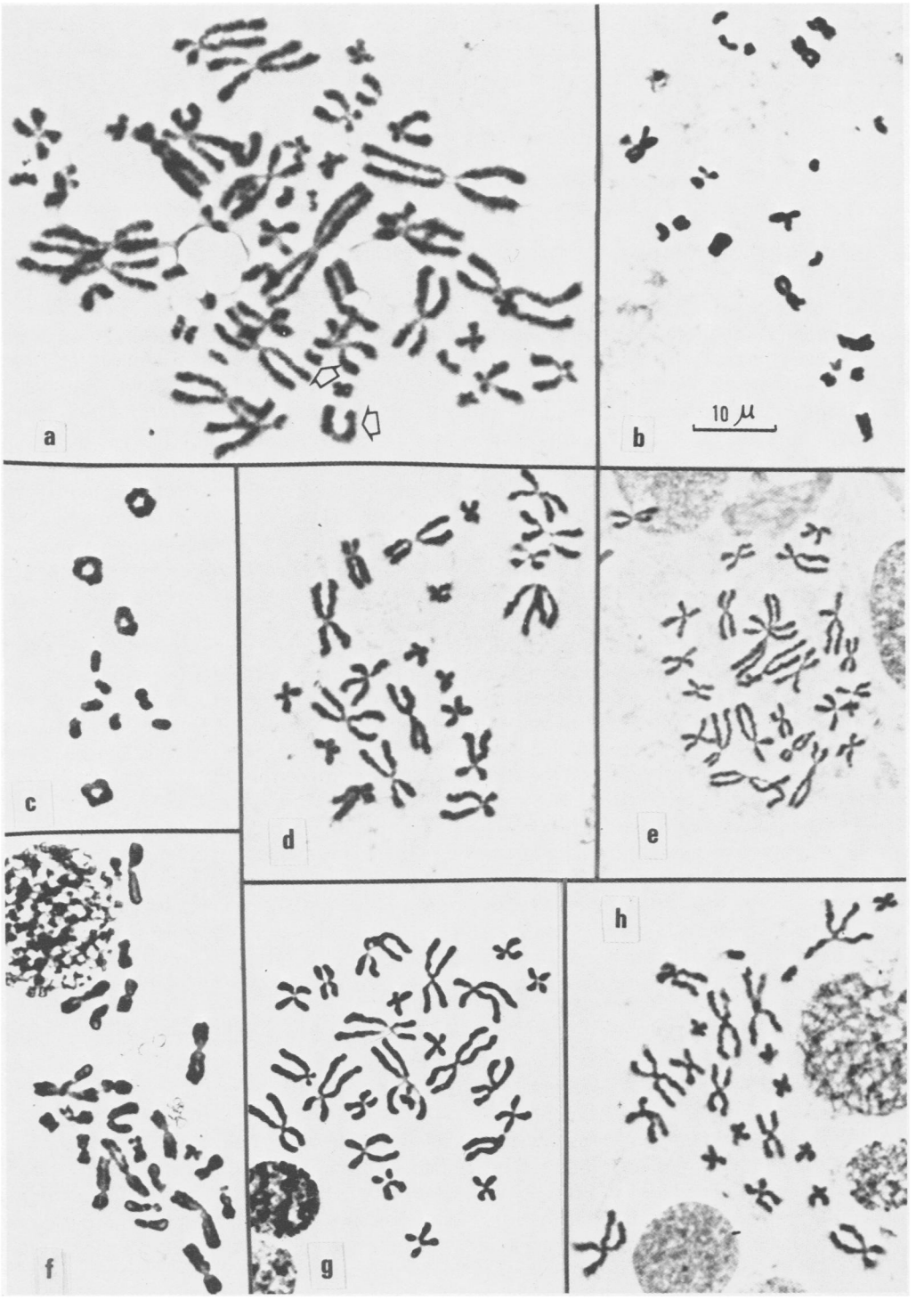

FIGURE 1. a. Intestinal metaphase plate of *Hynobius nebulosus* male; b and c. Intestinal and meiotic metaphase plates of a male *Pipa pipa;* d. Intestinal metaphase plate of *Gastrophryne carolinensis* male; e. Spermatogonial metaphase plate of *Kassina wealii;* f. Spermatogonial metaphase plate of *Rhacophorus leucomystax;* g. Intestinal metaphase plate of *Hemisus marmoratus* female; h. Spermatogonial metaphase plate of *Bufo melanostictus.*

of larger, and 5 pairs of smaller chromosome pairs, meta- or submetacentric with the exception of the smallest pair, which is done by subacrocentric elements. In contrast with a recent report (Manna and Bhunya, 1966), this species clearly does not present heteromorphic sex chromosomes, in the specimens we examined.

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SOME INTESTINAL PARASITES OF THE LOGGERHEAD MUSK TURTLE *(STERNOTHAERUS M. MINOR).*

Examination of helminth parasites may reveal differential infection with size or sex of the host (Esch and Gibbons 1967). Such studies, though rare in herpetological literature, contribute to a more thorough understanding of the ecology of both host and parasite species. The present study provides information on the enteric helminths from loggerhead musk turtles (*Sternothaerus m. minor*) from Florida.

Turtles (N = 32) were collected on 21 August 1968 between the Ichetucknee Spring boil area and Highway 27, Columbia County, Florida. All specimens were dissected within 6 hours and the digestive tracts placed in AFA solution.

The intestinal contents were removed and the parasites separated. Nematodes were removed to 70 percent ethanol, identified and counted. Plathyhelminths (all trematodes) were washed in 70 percent ethanol, stained in Semicohns acetocarmine, mounted, and identified.

Only 13 turtles (41 percent) contained parasites. Mean numbers of parasites per infected individual were 2.1 nematodes and 1.1 trematodes. No statistically significant differences between the sexes were observed with respect to incidence of parasitism (nematodes: $\chi^2 = 0.54$; trematodes: $\chi^2 = 0.54$; nematodes or trematodes: $\chi^2 = 1.42$) although more males were infected than females. No trends were apparent in regard to incidence of infection by different size (weight) classes (Table 1).

At least 5 species of enteric helminths were found in the turtles (Table 2). *Spiroxys contortus* was the most abundant parasite and the only nematode. Acenthocephalans were completely absent.

These results suggest a low level of internal parasite infection for the population. Examination during other seasons might, however, reveal heavier parasite loads. Since no correlation