phan pyrrolase activity[3] as they do in *Drosophila*[4,5], in *Rana*[6], and in rat liver[7–10]. However, high concentrations of tryptophan inhibit pyrrolase activity in vitro (Table II) in contrast to the enzyme of *Drosophila*[11,12]. There may exist ES_2-complexes instead of the normally functional enzyme-substrate-units (ES). If so ES_2 must be assumed to be nearly inactive. But the small activity of 0.0012 μM kynurenine/h/mg protein at substrate concentration of 0.01 M try/l remains constant until the tryptophan concentration is raised by a factor of 6. It is not known whether ES_2-complexes exist in vivo after tryptophan has been fed. However, the normal tryptophan concentration in vivo is not high enough to have a regulatory influence on pyrrolase activity.

Zusammenfassung. Die Metabolite und 3 Enzyme des Tryptophanstoffwechsels von *Habrobracon* weisen während der parasitären Phase sowie während der Puppenruhe und im Imaginalstadium signifikante Konzentrations- bzw. Aktivitätsveränderungen auf. Diese sind das Ergebnis mindestens zweier Regulationsmechanismen.

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The Close Karyological Affinities between a *Ceratophrys* and *Pelobates* (*Amphibia Salientia*)

The South American Anuran, which are of very considerable taxonomic interest in view of the great number of families and species that exist in that area, are the object of karyological research at the present moment, being undertaken chiefly by the school of SAEZ. SAEZ and BRUM[1] have observed, among other things, that *Ceratophrys ornata* has a chromosome set that is numerically very high ($2n$ = 89, 92, 98 and 108).

I myself have collected karyological data regarding certain species of South American Anuran, and I here describe the results of a karyological study of specimens of *C. calcarata* originating from Columbia, which I consider to be interesting.

The chromosome set of this species consists of 26 chromosomes: 12 large and 14 smaller ones; one pair of these shows vast heterochromatic areas (Figure 1, arrows). In the male line there are 13 meiotic bivalents, each of which is usually provided with 2 terminal chiasmata.

As regards the number and morphology of the various pairs of homologues, the karyotype of *C. calcarata* (belonging to the family of the *Leptodactylidae*, which, however, various authors classify in a new family detached from the former: the *Ceratophrydae*) is very similar to that of *Pelobates cultripes* (Figure 2; MORESCALCHI[2]), belonging to the family of the *Pelobatidae*.

Figure 3 shows the genomes of the 2 species, reconstructed schematically by using a chromosome of each pair of homologues of a somatic metaphase of *Ceratophrys* (below) and of *Pelobates* (above). It may be seen that the various chromosomes correspond in order, as regards form and relative dimensions, in the 2 species (this is also the case for the chromosomes provided with heterochromatic areas, situated in the seventh place), except those in the sixth place, which in *Pelobates* have the centromere in a more distal position.

With regard to certain characteristics, the karyotype of *Ceratophrys* may also be compared with that of *Hyla* (MORESCALCHI[3]) which, however, appears more differentiated from this point of view, in accordance with the systematic data (REIG[4]; GRIFFITHS[5]; HECHT[6]).

I maintain that the considerable karyological affinity that exists between *Ceratophrys* and *Pelobates* may provide useful indications regarding the taxonomic relationships of the Leptodactylids, or of a part of them (the possible *Ceratophrydae*).

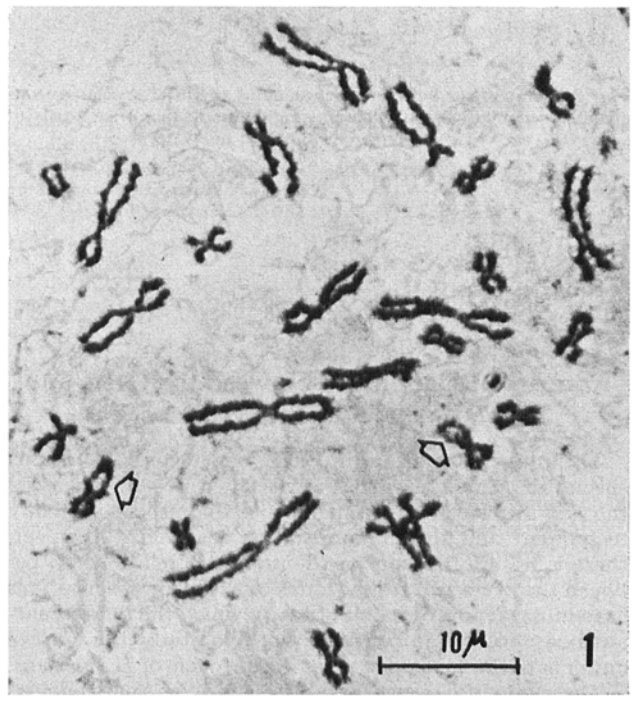

Fig. 1. Intestinal metaphase plate of a ♂ of *Ceratophrys calcarata*. The arrows indicate the chromosomes provided with heterochromatic areas. Mayer's acid hemalaun.

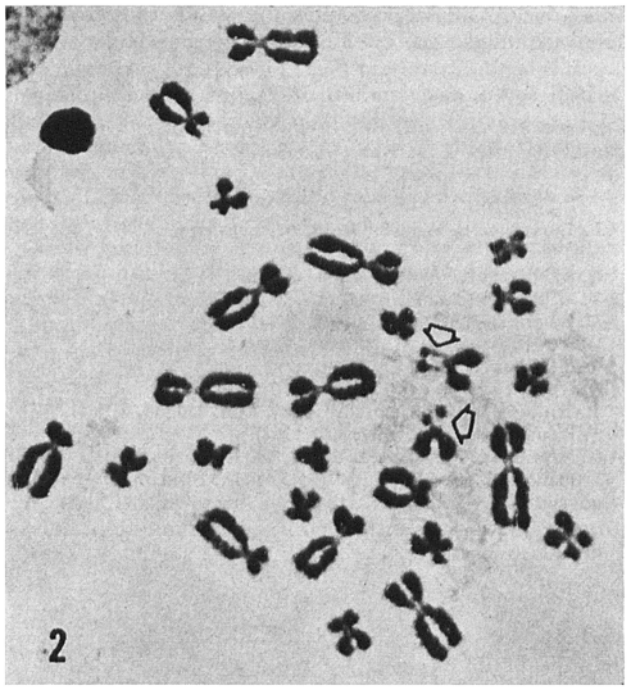

Fig. 2. Intestinal metaphase plate of a ♂ of *Pelobates cultripes*. The arrows indicate the chromosomes provided with heterochromatic areas. Mayer's acid hemalaun.

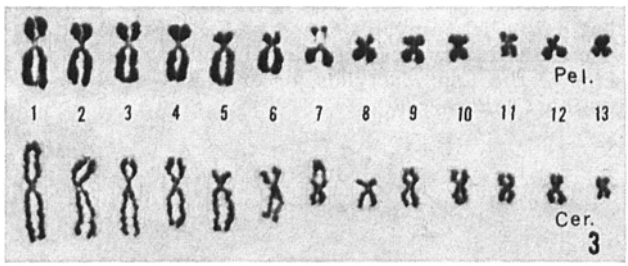

Fig. 3. Comparison between the genomes of the 2 species, reconstructed schematically by using a single homologue of each pair of the set shown in Figures 1 and 2.

The phyletic significance of the vast and perhaps heterogeneous grouping of the Leptodactylids is under discussion today; this grouping seems older than was previously thought and some authors consider that it is here that the differentiation arises in the forms that have produced the Anuran of the more highly evolved families (LAURENT[7]; REIG[4]; HECHT[6]).

Within the Leptodactylids, *Ceratophrys* appears as a primitive karyological form, the relationships of which with *Pelobates* seem extremely interesting, particularly in view of the fact that the derivation of the *Pelobatidae* from the stock of the *Discoglossidae* seems karyologically improbable, contrary to the commonly held view: according to the karyological data collected by myself[8], the *Discoglossidae*, together with the *Ascaphidae*, could constitute a branch of Anuran that had become differentiated from the remaining families at an early period and had evolved along lines of its own[9].

Riassunto. Il cariotipo di *Ceratophrys calcarata* (*Leptodactylidae* o *Ceratophrydae*) consta di 26 cromosomi, 12 grandi e 14 più piccoli; il settimo paio mostra zone eterocromatiche. Il genoma di *Ceratophrys* presenta una stretta somiglianza con quello di *Pelobates cultripes* (*Pelobatidae*); l'A ritiene che questo fatto possa fornire utili indicazioni sulle relazioni tassonomiche dei *Ceratophrydae*.

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Antigenic Relationship between the Cysts and Trophozoites of *Entamoeba invadens*

The antigenic relationship of the trophozoites of various species of *Entamoeba* has been studied previously using the gel-diffusion technique[1], the fluorescent-antibody technique[2] and the immobilization reaction[3]. However, there is no information on the antigenic relationship between the cysts and trophozoites of the same species. This is an initial report of such a study in which the fluorescent-antibody technique has been used to study the surface antigens of the 2 main stages in the life cycle of *E. invadens*.

The strain of *E. invadens* (BC) used in this study encysts in large numbers, 5–6 days after subculture, when grown in Difco's Entamoeba medium[4]. To prepare the antigens, the cysts were washed 3 times in sterile distilled water by centrifugation and stored at 5 °C overnight. The process was repeated daily for 3 days until a pure suspension of cysts, completely free of trophozoites, was obtained. The cysts were transferred to physiological saline and injected into rabbits for immunization. The immunization schedule consisted of 4 injections given i.v. at 7-day intervals. In total, approximately 1 million cells were injected per animal.

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