D. buzzatii is a cactophilic species known to be highly associated with prickly pear (*Opuntia* sp.)[17]. We have observed (unpublished work) that among all *Drosophila* species which coexist in the *Opuntia* areas of the Old World, only *D. buzzatii* can efficiently exploit rotted *Opuntia*. We have also analyzed (unpublished results) alcohol content in rotted *Opuntia* from 5 different localities and found that isopropanol is the most abundant; the mean isopropanol content is of the order of the concentrations tested in our experiment. However, there is a large variability in the isopropanol concentration in samples of rotted *Opuntia*.

In a natural population, rotted material with a high isopropanol content would favour the Adh^F genotypes, whereas those with a low content would not. Other selective factors should be found to operate in order to explain satisfactorily the maintenance of this polymorphism in nature, but the posttranslational mechanism here suggested would support the notion of an adaptive significance of *Adh* polymorphism in *D. buzzatii*.

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Cytotaxonomy of the Seychelles tree frog, *Megalixalus seychellensis* (Duméril and Bibron) (Amphibia: Hyperoliidae)[1]

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Summary. The Seychelles tree frog, *Megalixalus seychellensis* has 2n=24 chromosomes of gradually decreasing length. Pairs 2, 3, and 4 are submetacentric, and the remaining pairs are metacentric. The karyotype affirms hyperoliid assignment of this species, and indicates a link between the Seychellean fauna and the African-Madagascan faunas.

Ranoid frogs may be divided into 2 major groups based on the presence or absence of an intercalary cartilage between the ultimate and penultimate phalanges. Those without intercalary cartilages are generally ground-dwelling or terrestrial forms, whereas those with intercalary cartilages are usually arboreal in habit. The relationships among the genera of arboreal ranoids are poorly understood, and their classification has been highly unstable[2,3]. Liem's[3] study of ranoid frogs led him to conclude that the arboreal genera form 2 monophyletic assemblages evolved from 2 separate, terrestrial ranoid groups. 1 group of arboreal genera, the Hyperoliidae, is thought to have evolved from a group of terrestrial African ranids, and the 2nd arboreal group, the Rhacophoridae, is believed to be derived from terrestrial, Asiatic ranids.

The Hyperoliidae and Rhacophoridae have overlapping ranges and complementary east-west diversity gradients. Hyperoliid diversity decreases in an easterly direction. There are 11 genera and 63 species of hyperoliids in Africa, 1 genus and 2 species in Madagascar, and a single, monotypic genus *(Megalixalus)* in the Seychelles Archipelago. By contrast, rhacophorid diversity increases in an easterly direction: 1 genus and 4 species in Africa, 6 genera and 44 species in Madagascar, and 8 genera and 66 species in Asia. The presence of the hyperoliid, *Megalixalus seychellensis*, in the Seychelles seems anomalous since the Seychelles Archipelago lies between the 2 major centers of rhacophorid diversity (Madagascar and Asia) and far (1600 km) from the major center of hyperoliid diversity (Africa). Furthermore, the ancient elements of the endemic flora and fauna of the Seychelles indicate a closer affinity to the Oriental than to the Ethiopian region[4]. Given these facts of distribution, one would have predicted, a priori, a rhacophorid relationship for arboreal, Seychellean ranoids. However, as I will show, comparison of the karyotype of *M. seychellensis* to the karyotypes of other arboreal ranoids supports the current assignment of *M. seychellensis* to the Hyperoliidae.

Specimens were collected 26 August 1977, at 400 m along the Grand Bois River, Mahé, Republic of Seychelles. Meiotic and mitotic karyotypes were obtained from 3 adult males which are now in the collections of the Museum of Zoology, The University of Michigan (UMMZ 146624-6). A squash technique, described elsewhere[5], was used to obtain the karyotypes. *M. seychellensis* has a karyotype

(figure) with 2n = 24 and NF = 48. Chromosome Nos 2, 3, and 4 are submetacentric, and the remaining 9 pairs are metacentric (table 1). The chromosomes decrease in length gradually. There were no heteromorphic pairs of chromosomes, and no markers were observed. Testicular squashes revealed numerous diplotenes with terminal chiasmata.

I have summarized the available literature on hyperoliid and rhacophorid karyology in table 2. In compiling table 2, I have discarded questionable data caused by nomenclatural ambiguities, and I have accounted for shifts in generic assignment where possible. I also eliminated redundancies created by taxonomic synonomies unknown to cytological investigators.

Aside from *M. seychellensis*, 7 genera and about 25 species of hyperoliids have been karyotyped. The majority has a diploid chromosome number of 24, although 6 species of *Leptopelis* have 2n = 22, and 1 *Leptopelis* has 2n = 30 chromosomes. 2 species of *Hyperolius (argentovittis, cinctiventris)* were reported to have 2n = 26[6], and these data have been rather uncritically cited by several authors. Both *H. argentovittis* and *H. cinctiventris* are now considered to be junior synonyms of *H. parallelus*[7], and this latter species was reported to have 2n = 24[8]. Because of these conflicting reports, and because at least 5 species of *Hyperolius* are known to have a diploid number of 24 chromosomes, the existence of diploid karyotypes of 26 chromosomes in *Hyperolius* requires verification.

10 genera and about 39 species of rhacophorids have been karyotyped. The most common diploid number for this group is 26. 1 Madagascan genus, *Mantidactylus*, has 11 species with 2n = 26 and 6 species with 2n = 24. There is good evidence that species of *Mantidactylus* with 24 chromosomes are derived from an ancestor with a karyotype of 26 chromosomes and with chromosomal characteristics very similar to those of living *Mantidactylus* which have 2n = 26[9].

Morescalchi[6] has argued persuasively that the ancestral diploid number for ranoid frogs is 26. Rhacophorids apparently have retained the ancestral chromosome number, with a derived number of 24 chromosomes occurring in 6 species of *Mantidactylus*. The most common diploid number across hyperoliid genera is 24, a fact which indicates that 24 is the ancestral diploid number for this group.

Aside from chromosome number, hyperoliids and rhacophorids differ in details of the karyotype. Scheel[8] reported that African hyperoliids are characterized by karyotypes in which the chromosomes gradually decrease in length, and Blommers-Schlösser[9] found that Madagascan hyperoliids are distinguished from all other Madagascan ranoids by the combination of 24 chromosomes and gradual decrease in chromosome length. Rhacophorids and terrestrial ranids generally have a set of large and a set of small chromosomes with a discontinuity in length between chromosomes 5 and 6 or between chromosomes 6 and 7. *M. seychellensis* is clearly related to the African and Madagascan hyperoliids according to both chromosome number and the distribution of chromosome lengths. A detailed comparison of the relative lengths of the chromosomes and their centromeric positions demonstrates that Seychellean *Megalixalus* and Madagascan *Heterixalus*[9] have virtually identical karyotypes.

M. seychellensis is unusual in that it is morphologically the most primitive hyperoliid[10-12] and because it is by far the largest hyperoliid frog. These facts indicate that the species has no close relatives, and, therefore, that it is not a recent immigrant to the Seychelles Archipelago. Data presented in this paper affirm, however, a hyperoliid affinity for the species. In contrast to many of the older, endemic Seychellean forms which indicate an Oriental connection, *M. seychellensis* appears to represent an African-Madagascan link for the Seychellean fauna.

Table 1. Quantitative characteristics of *Megalixalus seychellensis* chromosomes[13]

Chromosome No.	Relative length	Arm ratio	Centromere index	Centromere position[14]
1	14.5	1.6	39.3	M
2	12.4	2.1	32.8	SM
3	11.6	1.7	37.3	SM
4	9.8	2.3	30.6	SM
5	9.3	1.4	43.0	M
6	7.7	1.2	46.2	M
7	6.8	1.6	39.9	M
8	6.6	1.0	50.0	M
9	6.0	1.0	50.0	M
10	5.8	1.3	44.3	M
11	5.4	1.1	48.3	M
12	4.9	1.2	46.4	M

Table 2. Summary of hyperoliid and rhacophorid chromosome numbers

Taxon	2n	No. of Species	Range
Hyperoliidae			
Afrixalus[8,15]	24	2	Africa
Heterixalus[9]	24	2	Madagascar
Hyperolius[8,15,16]	24	5	Africa
Kassina[6,15]	24	4	Africa
Leptopelis[15]	22	6	Africa
Leptopelis[15]	24	4	Africa
Leptopelis[15]	30	1	Africa
Megalixalus	24	1	Seychelles
Opisthothylax[15]	24	1	Africa
Rhacophoridae			
Aglyptodactylus[9]	26	1	Madagascar
Boophis[9]	26	4	Madagascar
Buergeria[17]	26	3	Asia
Chirixalus[17]	26	1	Asia
Chiromantis[15]	26	2	Africa
Gephyromantis[9]	26	4	Madagascar
Mantella[9]	26	3	Madagascar
Mantidactylus[9]	26	11	Madagascar
Mantidactylus[9]	24	6	Madagascar
Polypedates[6]	26	2	Asia
Rhacophorus[17]	26	2	Asia

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