species) has $2n=60$: in both there is a larger number of A chromosomes than in the other species of *Hynobius*[7,8].
These last data indicate the existence, among the Hynobiids, of many of the initial stages that occurred along the karyological differentiation of the Urodeles from bimodal karyotypes rich in chromosomes and microchromosomes, to the symmetrical and numerically reduced karyotypes of the 'higher' families.
As to the diversification of genome size, the Hynobiids comprise species with a relatively low amount of DNA, compaired to other Urodeles, with the possible exception of *Onychodactylus*[11].

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Attractive behavior toward human constructions helps to explain the domestic and cosmopolitan status of some Drosophilids

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Summary. Big differences in the Drosophilid adults collected by traps placed within a short distance were observed during a study in tropical Africa. These can be explained mainly by divergent behavior towards man-made constructions. In most cases, adults strictly avoided entering buildings. On the other hand, some species, mainly *D. melanogaster,* appeared to concentrate within man-made constructions. This preference can be considered as a preadaptation which allowed exploitation of new, poorly competed food sources and also favored transportations with fruit shipments all over the world.

Among Drosophilids, more than 15 species have reached a subcosmopolitan and, in most cases, a domestic status (David and Tsacas, in preparation). Although these species are generally considered as opportunist, generalist and r strategist, a careful analysis failed to show any consistent general genetic properties[2,3] leading to the conclusion that a special analysis should be made in each case. Recently, attention has been drawn[4] to a high stress tolerance which could characterize cosmopolitan species. Behavioral characteristics, much studied in the laboratory[5] seem, however, to have received only little attention in the wild. During a survey of the drosophilid fauna of the popular republic of Bénin, in tropical Africa, it was noticed that species collected with banana baits differed according to the position of traps. The problem was further studied in special experiments. Results, presented here, gave consistent conclusions which certainly help to explain the ecological status of some *Drosophila* species and particularly of the most widespread *D. melanogaster.*
Experiments were made on the campus of the University of Bénin, about 10 km north to Cotonou. The University is built in the country and is surrounded by cultivated fields, orchards and small woods, with no village in the vicinity. 5 different trapping sites were used and flies were collected every day, usually in the morning. The location of the traps, with respect to university buildings, is given on the map figure 1. These places were chosen as function of the local possibilities and, mainly, of the availability of shadow.
Altogether more than 1800 flies, belonging to 14 different species, were collected and results are given in the table. No indication of any modification of the fauna for the duration of the experiment was obtained. Results are, however, highly different between traps. Traps 1 and 2, outside the buildings and placed below trees, collected an abundant fauna with the highest diversity. Trap 1 is remarkable for the rarity of *D. melanogaster* and the predominance of *D. malerkotliana* and of various species of the *Zaprionus* genus. Trap 3, although close to trap 2 and to the outside of the building, yielded a very different fauna. Flies were clearly less abundant, only 6 species were found and *D. melanogaster* represented about 90% of the total catch. Trap 4 confirmed the above difference. A great number of flies were collected there but they all belonged to only 5 species and *D. melanogaster* constituted more than 95% of the catch. Trap 5 was set a few days after the beginning of the experiment in order to check if the avoidance behavior shown by most species toward tall concrete buildings could also be observed versus a low, primitive shelter, and also to determine if *D. melanogaster* could be found in abundance at a distance of 100 m from the main buildings. Results were clearly conclusive: almost no *Zaprionus* were collected in trap 5, which however produced 117 *D. melanogaster.*

All these results are coherent. *D. melanogaster* was more abundant in the vicinity of the university buildings (traps 2, 3 and 4) than in traps 1 and 5 placed at a distance of 100 meters. Apparently such a short distances was sufficient to provide a fairly strong isolation of 2 populations. Perhaps, in this special case, the isolation was favored by the occurrence of bare, non-shadowed area between the build-

ings and traps 1 and 5, and also by the direction of the dominant wind (see figure 1).
Position of the traps with respect to human construction appears, however, to be the essential parameter explaining the differences in catches. This is clearly shown by the graphs of figure 2. *Zaprionus* species, numerous outside the buildings, are almost absent within. This avoidance behavior was shared by some other species, such as *D. nasuta* and *D. latifasciaeformis*. Light intensity was measured at the level of the various traps and it was found to be about 4 times lower in sheltered places (traps 4 and 5) than below the trees of trap 1. However, the luminosity at site 3, which almost did not collect any *Zaprionus*, was about twice that measured for trap 1. Further studies are thus needed to understand the external, propably visual, signals which explain this behavior.

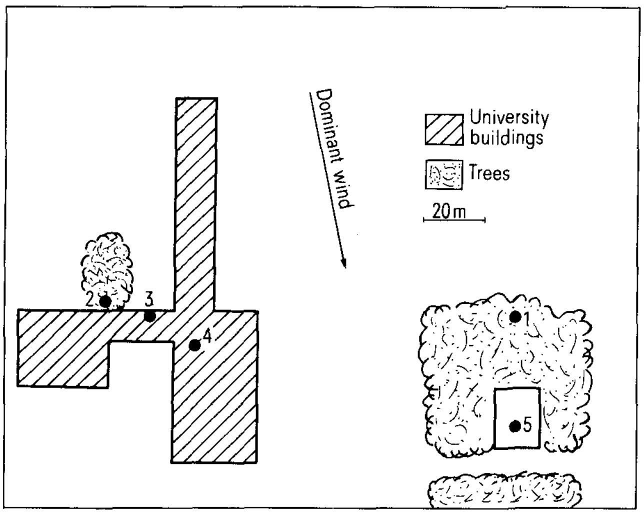

Fig. 1. Diagram of the position of the 5 traps (●, numbered 1-5) relatively to man-made buildings and shadowed areas. Trap 1 was 100 m from the laboratory buildings, below a big mango tree. Trap 2 was put below small trees, a few m outside a building. Trap 3 was placed at about 10 m from trap 2, close to a big opening and 20 cm within the building. Trap 4 was near trap 3 (10 m) within a laboratory hall connected with the outside by large, permanent openings. Trap 5 was placed at about 40 m from trap 1 but protected by a man-made construction. This was not a concrete building but a primitive shelter with lateral wall on 1 side only and a roof of corrugated iron.

D. melanogaster, on the other hand, did not avoid sheltered places. A comparison of results of traps 1 and 5, which were separated by only 40 m of shadowed area and which were working within the same drosophilid population, demonstrates that this species was indeed attracted by man-made constructions. Among the other species, *D. ananassae*, although rare, appeared also to concentrate within the buildings. Observations in other places confirmed this conclusion. For example in Djeffa, about 15 km east of Cotonou, *D. ananassae* was more abundant than *D. melanogaster* within the village houses. Finally *D. malerkotliana*, another subcosmopolitan species, very abundant in this study, was not attracted by man-made construction but was not completely repelled.
Capacity of entering man-made constructions is not a necessity for becoming a cosmopolitan species: for example *D. latifasciaeformis*, which is widespread all over the world, was not collected within buildings. A similar analysis of all presently known subcosmopolitan species would be of great interest. For species like *D. melanogaster*, *D. ananassae* or *D. malerkotliana*, the capacity of entering artificial constructions such as warehouses or fruit markets will increase

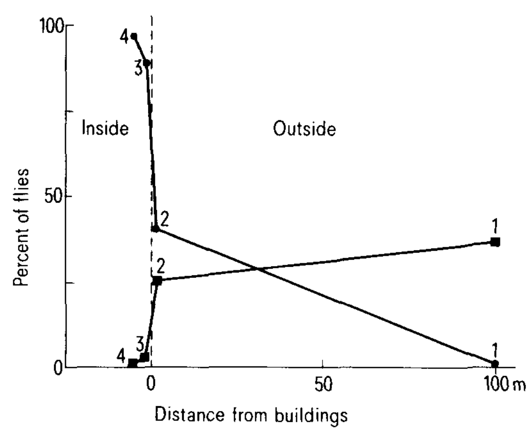

Fig. 2. Variation of the frequency of Drosophilids in relation ot the distance between the trap and the buildings. ●, *Drosophila melanogaster*; ■, *Zaprionus* sp. (The major discontinuity occurs within a few m of the building).

Numbers of Drosophilids collected at the 5 traps indicated in figure 1 (* indicates cosmopolitan or subcosmopolitan species known from at least 2 different biogeographic regions)

Species	Trap number 1	2	3	4	5	Total catch n	%
Drosophila							
*D. melanogaster**	5	162	181	468	117	933	51.41
D. yakuba	1	9		1		11	0.61
*D. ananassae**		1	1	6		8	0.44
*D. malerkotliana**	253	81	12	7	14	367	20.22
D. greeni	2					2	0.11
D. bakoue	4	2			1	7	0.39
*D. latifasciaeformis**	66	20	4	1		91	5.01
D. agamse	1					1	0.06
*D. buzzatii**	1				1	2	0.11
*D. nasuta**	4	2	1			7	0.39
Zaprionus							
Z. vittiger	214	101	5			320	17.63
Z. tuberculatus	32	24			1	57	3.14
Z. sepsoides	6	2				8	0.44
Z. ghesquierei	1					1	0.06
Total	590	404	204	483	134	1815	100.0

the probability that a female will oviposit on decaying fruits which will then be sent a long distance away. This constitutes a great advantage if we consider the capacity of long distance migrations and colonization of new places. Moreover, the possibility for these species to thrive within man-made constructions affords them a new type of habitat. This behavioral property is surely involved in the well known 'liking' of *D. melanogaster* for garbage cans. Also the occurrence of huge populations of *D. melanogaster* in wine cellars of temperate countries is not only due to the high alcohol tolerance of the species[6], but also to the behavioral characteristics described here.

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Cytogenetics of South American akodont rodents (Cricetidae). V. Segregation of chromosome No. 1 polymorphism in *Akodon molinae*[1]

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Summary. Akodon molinae is polymorphic with 2n = 42, 43, 44, where the metacentric autosome No. 1 is homologous to 2 acrocentrics 1a and 1b. Matings between 2n = 43 heterozygotes 1/1a, 1b gave a surplus of 1/1 offspring, a moderate reduction of heterozygous and a strong reduction of homozygous 1a, 1b/1a, 1b offspring. The latter type also has a highly reduced fertility.

Most species of the genus *Akodon* (Rodentia Cricetidae) exhibit noteworthy chromosomal rearrangements involving the sex chromosomes or the autosomes[2,3]. Among these species, *Akodon molinae* shows a remarkable polymorphism of chromosomes 1. Thus, in a given population of *A. molinae* it is possible to find animals with 42, 43 and 44 chromosomes[3,4]. Specimens with 42 chromosomes have the pair 1 formed by 2 large submetacentric chromosomes easily identifiable; animals having this karyotype are named simple homozygous (SH). Specimens with 43 chromosomes show 1 chromosome No. 1 and 2 medium-sized subterminal chromosomes, 1a and 1b, which pair with the long and short arms of chromosome 1, respectively. The homology of chromosomes 1a and 1b with the arms of chromosome 1 has been determined by the appearance of trivalents in male meiosis and by the equivalent pattern of G-banding exhibited by the long arm of chromosome 1 and the chromosome 1a and by the short arm of chromosome 1 and the chromosome 1b[3,4], animals with 43 chromosomes are designated as heterozygous (Ht). Finally, the specimens with 44 chromosomes have one pair of chromosomes 1a and one pair of chromosomes 1b; these animals are named double homozygous (DH). The remaining chromosomes in the complement of *A. molinae* are acrocentrics, with the exception of the smallest autosomal pair (pair 20) which is metacentric. The X pair is the 2nd acrocentric pair in size while the Y chromosome is one of the smallest acrocentrics of the set.

Material and methods. A laboratory colony of *A. molinae* was started from several mating pairs collected in the area of Chasico, Province of Buenos Aires, in 1972. At the present time, the colony comprises approximately 150 animals in the F_6 or F_7. The karyology of most laboratory specimens was determined in vivo by the diffusion microchamber technique[5]. Heterozygous animals from the F_3 generation were selected and mated. Chromosome analyses of the next filial generation (F_4) were also performed in vivo by the microchamber method. A total of 160 animals in the F_4, derived from 10 pairs of Ht × Ht specimens, are included in this report. The results obtained were statistically analysed by the chi square and the Student t-test.

Results and discussion. Table 1 shows the observed and expected frequencies of SH, Ht and DH animals. The χ^2 test shows that the observed frequencies deviate significantly from the theoretical expectations. Moreover, the t-test indicates that differences between observed and expected numbers result from an increase in SH, a significant decrease in DH animals and a decrease in Ht specimens which is on the borderline of statistical significance.

A preferential segregation of chromosomes 1, 1a and 1b during oogenesis is one of the mechanisms to be considered to explain the observed frequencies of SH, Ht and DH animals. In this process, the chromosomes 1a and 1b would be preferentially included in the polar body nuclei while chromosome 1 would mainly migrate into the egg nucleus. Such a mechanism has been proved regarding the behaviour of sex chromosomes in *Drosophila pseudobscura* and related species[6,7] and also in *Sciara*, in aphids[8,9] and in the moth *Talaeporia*[10,11]. In the case of mammals it has been demonstrated that in XO mice the X chromosome does not segregate randomly but remains preferentially in the oocyte[12]. A non-random segregation would automatically pro-

Table 1. Segregation of chromosomes No. 1, 1a and 1b in *A. molinae* among the offspring of 10 Ht × Ht matings

Karyotype	SH	Ht	DH	χ^2
Observed frequency	74	64	22	
				$p < 0.0005$
Expected frequency	40	80	40	
Student's t-test	$p < 0.001$	$p > 0.05$	$p < 0.005$	Total: 160 animals