Co-orientation of the trivalent is very regular, assuring that the Y-chromosome moves to 1 pole an both X_1- and X_2-chromosomes to the other (figure 5). 2nd metaphase cells have 18 (figure 8) or 19 chromosomes (specimens from Torremolinos), or 19 or 20 chromosomes (specimen from Torrevieja, figure 9).

Discussion. The specimens from Torremolinos have the supposedly ancestral chromosome number of Caraboidea, 2n=37[7]. Thus, the karyotype of 39 chromosomes has probably originated through a dissociation that gave rise to 1 pair of medium sized subtelocentric chromosomes plus a very small pair of undetermined morphology.

The 3 other species of *Scarites* studied have the primitive XO sex-chromosomes system of the Caraboidea[7,9,10]. For this reason the X_1X_2Y sex-chromosomes system of *S. buparius* appear to be a derived one. As both X_1- and X_2-chromosomes are partially homologous with the Y-chromosome, we conclude that there has been a reciprocal translocation between the primitive X-chromosome and an autosome. This one has become the X_1-chromosome and shows in the arm where chiasmata are not formed a secondary constriction that perhaps denotes the site of the interchange. Its homologue has become the Y-chromosome and the primitive X is now the X_2-chromosome.

The fact that subterminal chiasmata are formed between the Y-chromosome and the 2 Xs suggests to us on the one hand that segments interchanged in the translocation are of some magnitude, and on the other hand that this restructuring is probably of relatively recent origin, so that heterochromatinisation has not yet restricted the formation of chiasmata among the sexual chromosomes to terminal regions, as it is found in other caraboid beetles.

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Karyotype of South American pampas fox *Pseudalopex gymnocercus* (Carnivora, Canidae)

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Summary. The karyotype of the pampas fox has 2n=74 and a NF=76. Except for *Chrysocyon brachyurus*, 2n=74 is a common diploid number for the South American Canidae. This number is higher than in the *Vulpes* group and lower than in the group of the typical *Canis*. No 'marker chromosomes' are present in the South American Canidae.

Pseudalopex gymnocercus is 1 of the 4 species recognized at present in the genus *Pseudalopex*. The separation of *P. gymnocercus* from *P. culpaeus* is clear-cut. However, the relationships between *P. gymnocercus* and the 2 other species of this genus, *P. griseus* and *P. sechurae*, are not so clear and need further research. A study based on specimens from the contact zones between the areas of geographic distribution of each species would clarify their taxonomic relationships.

The genus *Pseudalopex* has been considered a synonym of *Dusicyon* by Cabrera[1], a subgenus of *Dusicyon* by Langguth[2] and a subgenus of *Canis* by Langguth[3] and by Van Gelder[4]. New information is needed to arrive at a stable classification of the Canidae. Species of *Pseudalopex* still retain many ancestral characters and show very few derived ones. Among the New World Canidae they show the closest morphological resemblance to the genus *Vulpes*.

The chromosomes of the Canidae have been recently reviewed by Chiarelli[5]. Wurster-Hill[6] and Gallardo and Formas[7] published additional information on *Cerdocyon thous* and *Pseudalopex griseus* respectively.

The present paper reports the karyotype of *Pseudalopex gymnocercus*. One adult male from Itapebí, Depto. Salto, Uruguay was employed in this study. The specimen, Nr. 1349, is kept in the mammal collection of the Depto. Zoología Vertebrados, Facultad Humanidades y Ciencias, Montevideo. Karyological studies were performed on C-metaphases obtained from bonemarrow cells, following the technique used by Fernandez[8]. The slides were stained with a buffered Giemsa solution pH 6.8.

In all the metaphases studied we found an identical chromosome complement with a diploid number of 2n=74, NF (female)=76 (figure). All autosomes are acrocentric or essentially so. Since autosomes are similar in morphology pairing is subjective. Identification of sex-chromosomes is however unequivocal. The X is the only biarmed element (submetacentric) and the Y is the smallest chromosome.

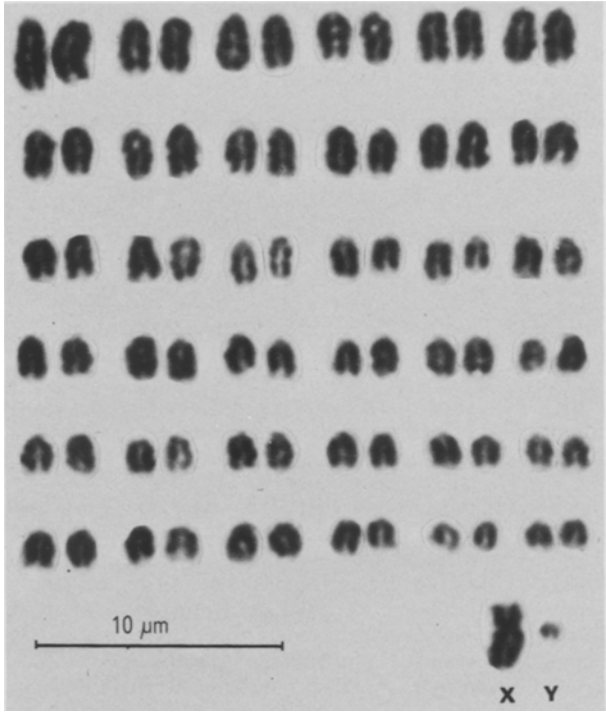
Knowing now the karyotype of *Pseudalopex gymnocercus* we have an almost complete picture of the karyotypic diversity in the South American canids. The following table gives the karyological information on the different species

Species	2n	NF (♀)	Autosomes M+SM	A+SA	Micro	Sex X	Y
Pseudalopex gymnocercus	74	76	0	72	0	SM	A
Pseudalopex griseus	74	76	0	72	0	SM	A
Atelocynus microtis	74-76	76	0	72	2	SM	?
Speothos venaticus	74	76	0	72	0	SM	A
Cerdocyon thous	74	110	34	38	0	?	?
Lycalopex vetulus	74	76	0	72	0	SM	?
Chrysocyon brachyurus	76	78	0	74	0	SM	A

(see Chiarelli[5] for the references to the papers where the original data have been published).

In this table we can see that 6 species have in common 2n=74. Only 2 species, *C. brachyurus* and *A. microtis*, present differences in diploid number. In the first one, an extra pair is present and in the latter 2 extra very small chromosomes (microchromosomes) occur in 1 of the 2 specimens investigated by Wurster and Benirschke[9]. Apart from this small variation the diploid number is the same in all other species, in spite of the great morphological differences existing among them. These are very clear when *Pseudalopex gymnocercus* is compared with *Speothos venaticus*, 2 species that also occupy very different ecological niches.

The karyotype of *Cerdocyon thous*, although keeping 2n=74, is rather aberrant, showing 34 metacentric autosomes and the highest NF (110) among the carnivora. How this high NF has been reached is an interesting point to be investigated. Perhaps it originated by pericentric inversions such as have been clearly established in the genus *Peromyscus* (Hsu and Arrighi[10]), or by acquisition of heterochromatic 'second arms' as is also found in the same genus (Duffey[11], Pathak et al.[12]) and in *Uromys* (Baverstock et al.[13]). It would be necessary to perform C-banding techniques on the chromosomes of *Cerdocyon thous* to confirm this assumption.



Karyotype of male *Pseudalopex gymnocercus*.

The uniformity of the karyotype of the South American canids, however, is not so striking as in the group of *Canis s.s.* and the allied genus *Lycaon*, where the 2n is 78 and the NF is always 80, even in the high polymorphic domestic dog. On the other hand, the South American group does not show the high karyotypical diversity observed in the genus *Vulpes* and related genera *(Otocyon, Urocyon* and *Fennecus)*. So the 2n and the NF of the South American canids are higher than in *Vulpes* and lower than in *Canis* having as a group their own karyotypical characteristic. The South American group including *P. gymnocercus* also lack the 'marker chromosomes', a generalized characteristic in the carnivora and an ancestral character in the Canidae, which is present in the genus *Vulpes* (Wurster and Benirschke[9]).

A question that remains to be worked out is the degree of intraspecific variability of the karyotype in this group of canids since very few individuals of each species have been studied. It would be also interesting to know what degree of homology exists between the particular chromosomes of *Chrysocyon* and *Cerdocyon* and the karyotypes of the species with a common NF=76; this could be investigated with banding techniques.

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Evidence for di-peptide uptake in *Tetrahymena*

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Summary. We have established growth conditions in a synthetic nutrient medium in such a way that utilization of free phenylalanine, but not of phenylalanine-containing di-peptides, limits cell multiplication in species of the genus *Tetrahymena* (Ciliata). These results suggest that these cells take up intact di-peptides.

How widespread is the occurrence of peptide uptake in pro- and eukaryote cells? So far, it has been established only in certain bacteria[1,2], yeast[3], barley seeds[4,5] and mucosa cells[5,6]. The results to be presented here suggest that it also occurs in species of the ciliate protozoon *Tetrahymena*.

Using growth conditions and cell counting procedures described elsewhere we obtained the results for *Tetrahymena* multiplication shown in the table. In a synthetic nutrient medium in which 17 amino acids (including phenylalanine) were present in concentrations around 2 mM each, we