would therefore appear that in this particular case hypertrophy of *tuberculum musculare* is connected with both the animal's age and also the effect of mechanical injury, and is a change of a secondary character.

REFERENCES

Empel W., 1962: Morphologie des Schädels von *Bison bonasus* (Linnaeus 1758). Acta theriol., *6*, 4: 53—112. Poplewski R., 1948: Anatomia ssaków. Układ kostnostawowy. Spółdz. Wyd. »Czytelnik«, *2*: 1—690. Stockholm. Wasilewski W., 1967: Differences in the wear of incisors in the European bison living under natural and reserve conditions. Acta theriol., 12, 32: 459—462.

Mammals Research Institute, Polish Academy of Sciences, Białowieża, Poland.
Accepted, September 4, 1972.

Stanisław FEDYK & Elena Yu. IVANITSKAYA

CHROMOSOMES OF THE SIBERIAN MOLE (*TALPA ALTAICA* NIKOLSKY, 1883)

CHROMOSOMY SYBERYJSKIEGO KRETA (*TALPA ALTAICA* NIKOLSKY, 1883)

The range of the Siberian mole (*Talpa altaica* Nikolsky, 1883) extends to the east from the River Irtysh, and occupies West and Central Siberia as far as Trans-Baikal. *T. altaica* is larger than *T. europaea*. It is most likely that the geographical ranges of these two forms are separated from one another by the River Irtysh (Yudin, 1971).

Three females Siberian moles caught in the Bakchar area (Tomsk region) were used for studies of chromosomes, the chromosome preparations being made from the bone marrow by the usual method after Ford & Hamerton (1956), and stained with Giemsa stain.

A total of 48 metaphase plates were studied from the three animals. In 36 of the plates a modal number of chromosomes $2N = 34$ were found, while the number of chromosomes in the remaining 12 plates varied within limits of 31—33. Analysis of plates with 34 chromosomes revealed the presence of one pair of markers with a paracentric gap on the short arm (p.g.: Figs 1, 2). In addition to this pair of markers 13 pairs of metacentric and submetacentric chromosomes of gradually decreasing dimensions occur in the karyotype of *T. altaica*, among which there is a pair of heterochromosomes (XX) and three pairs of subtelocentric chromosomes (Fig. 1, Plate IX). The fundamental number (*NF*) is 68.

Comparison of the karyotype of *T. altaica* studied with that described earlier for *T. europaea* (Gropp, 1969) shows that there are considerable similarities between the chromosomes of these two species, in both of which markers are present (p.g.). The presence of this marker was also shown in *Talpa mizura hercegovinensis* (cf. Todorović & Soldatović, 1969). In addition comparison of length of chromosomes and

the positions of centromeres in 12 pairs of meta- and submetacentric autosomes in *T. europaea* and *T. altaica* indicates how great the similarities are between these two species. The three pairs of subtelocentric chromosomes in *T. altaica,* however, have centromeres located more terminally than in *T. europaea* and *T. mizura.* In these last two species the longest of three pairs has a centromere situated on the boundary of regions st—sm.

It may therefore be stated that the karyotype of *Talpa altaica* ($2N = 34$, $NF = 68$) is closest to the karyotype of *T. europaea* ($2N = 34$, $NF = 68$), all the chromosomes possessing two arms in both species. The karyotype closest to these two species is that of *Talpa mizura hercegovinensis* ($2N = 36$, $NF = 68$) in which two pairs of single-arm autosomes occur (Todorović & Soldatović, 1969), and *Talpa caeca caeca* ($2N = 36$, $NF = 70$), in which one supernumerary pair of microchromosomes was found to be present, while the remaining chromosomes are morphologically similar to the chromosomes of *T. europaea* (Meylan, 1966).

The karyotypes of Caucasian moles *(T. caucasica* and *T. minima)* differ markedly from the above-mentioned species. There are no marker chromosomes in the two Caucasian species, and in addition in *T. caucasica* ($2N = 38$, $NF = 66$) there are 5 pairs, but in *T. minima* ($2N = 34$, $NF = 66$) one pair of single-arm chromosomes (Dzuev *et al.*, 1972; Kozlovsky *et al.*, 1972). In these two species only one pair of subtelocentric chromosomes was identified, and Y chromosomes of far larger dimension (in *T. europaea, T. caeca* and *T. mizura* Y chromosome is a dot-like).

The lack of data on the morphology of the Y chromosome in *Talpa altaica* made it impossible to establish beyond doubt that the karyotype of this species is similar to the karyotypes of the European forms *(T. europaea, T. caeca* and *T. mizura).*

After this note was in print a paper on karyotype of *Talpa altaica* from Novobirsk region appeared (Zool. Listy, 21, 3: 199—208, 1972) by Kratochvíl and Král, who reached similar results.

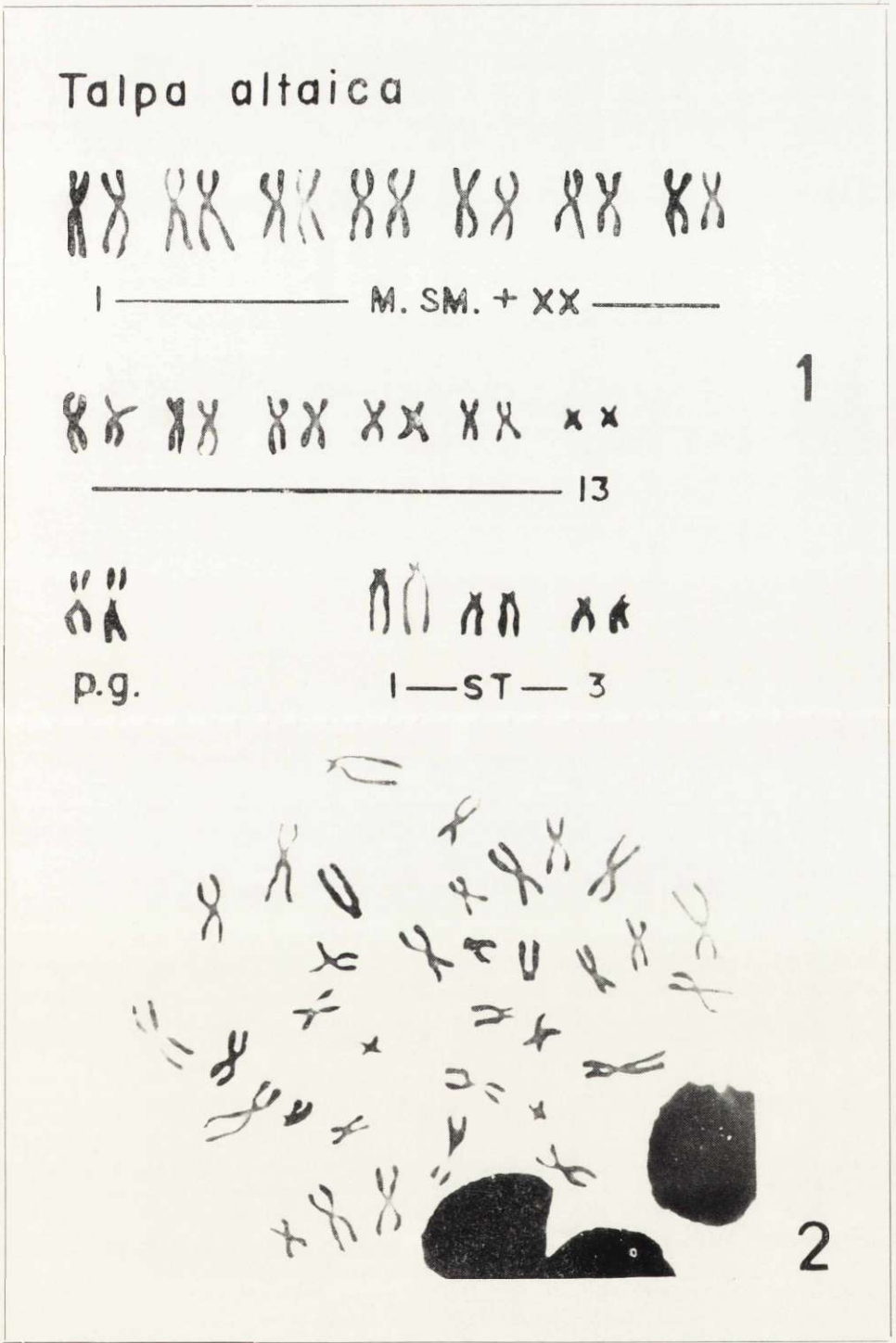
REFERENCES

Dzuev R. I., Ivanov V. G. & Tembotov A. K., 1972: Karyological investigation of mole *Talpa* L. of the North Caucasus [In Russian, English summary]. Bull. Mosk. Ob. Isp. Prir., Ser. Biol., *77*: 33—36. Ford C. E. & Hamerton J. L., 1956: A colchicine hypotonic citrate squash sequence for mammalian chromosomes. Stain technol., *31*: 247—251. Gropp A., 1969: Cytologic mechanisms of karyotype evolution in insectivores [In: »Comparative Mammalian Cytogenetics«, K. Benirschke, Ed.]. Springer Verlag: 247—266. Kozlovsky A. I., Orlov V. N. & Papko N. S., 1972: Systematic status of Causasian *(Talpa caucasica)* and common *(T. europaea)* moles by karyological data [In Russian, English summary]. Zool. Ž., *51*: 312—316. Meylan A., 1966: Données nouvelles sur les chromosomes des insectivores européens (Mamm.). Rev. suisse Zool., *73*: 548—558. Todorović M. & Soldotović B., 1969: Kariotip podvrste *Talpa mizura hercegovinensis.* Arh. biol. nauka, Beograd, *21*: 5—6. Yudin B. S., 1971: Insectivorous Mammals of Siberia [In Russian]. Publishing House »Nauka«, Siberian Branch, Novosibirsk: 1—170.

Mammals Research Institute, Polish Academy of Sciences, Białowieża, Poland, and Institute of Cytology and Genetics, Laboratory of Population Genetics, Academy of Sciences of the USSR, Siberian Branch, Novosibirsk 90, USSR. *Accepted, October 12, 1972.*

EXPLANATION OF PLATE IX

Karyotype of female of *Talpa altaica* (1) and mataphase plate (2).



S. Fedyk & E. Yu. Ivanitskaya *auctores phot.*