Brèves communications - Kurze Mitteilungen
Brevi comunicazioni - Brief Reports

Age of the Pleochroic-Halos of the Quartz-Monzonite of Eastern Elba

A complete geological and petrographical study of the granodioritic intrusive rocks of the isle of Elba has recently been carried out by MARINELLI[1]. The Elba intrusions are localized, the one in the western part of the island (Monte Capanne), the other, smaller and a little more acidic, in the south-eastern zone, near Porto Azzurro. While the age of the western intrusion is geologically rather well known[2], this is not the case with the eastern one.

The Monte Capanne granodiorite has already been studied by the pleochroic halos method by DEUTSCH *et al*[3], while such research has never been carried out on the Porto Azzurro one. The determination of the age of this rock is particularly interesting both in relation to the neighbouring intrusion only a few kilometers away, and in relation to the other age-determinations carried out on the Tuscan-archipelago and continental granites[4].

Despite the limitations of the pleochroic-halos method in age-determinations, these recent rocks are particularly well-suited to this kind of research. In fact we are interested in the relative chronology of the various granitic intrusions which may be related to the magmatic activity following the Appenninic orogenesis[5].

Besides, the recent age of these magmatic rocks allows us to detect relatively small differences in age, as the pleochroic-halos method allows us to determine age ratios rather than absolute ages.

The results have been obtained by studing a sample from the cores of a drilling carried out by Soc. "Montecatini" near Porto Azzurro, at a depth of about 275 m. This sample has been kindly given to me by MARINELLI, and described by him in the previously mentioned work. Some of the accessory minerals included in the biotite, with specific activities varying from 0.11 to 0.24 α/cm^2 sec, show no appreciable halos. The experimental points of the halos observed around the minerals with higher activities are plotted in the diagram.

The values of the D parameter of the optical density of the halos expressed in μm are plotted on the ordinate; the values of the specific activities of the corresponding emitting minerals are plotted on the abscissa. The points related to the halos of the Monte Capanne granodiorite are plotted on the same diagram, together with the calculated isochrones.

The sensitivity of the eastern Elba biotite to artificial irradiation, compared to that of the Monte Capanne biotite, has been experimentally studied using a Po^{210} source. (The details of the technique used will be described in a further note.) The sensitivity of the two biotites has been found to be practically identical. An examination of the experimental points and their related isochrones, leads us to conclude that there is no appreciable age difference between the two rocks.

It follows that the small quartz-monzonitic stock partially outcropping near Porto Azzurro, must be regarded as chronologically related to the same magmatic phase from which the Monte Capanne pluton originated.

A. LONGINELLI

C.N.R.N., Laboratorio Geologia Nucleare, Università di Pisa (Italia), March 31, 1960.

Riassunto

Nel quadro di una serie di ricerche tendenti a determinare le età relative delle rocce granitiche dell'arcipelago toscano e della Toscana continentale, è stata studiata con il metodo degli aloni pleocroici la quarzomonzonite di Porto Azzurro (isola d'Elba).

In base ai risultati ottenuti, riportati nel grafico, si può asserire che non vi è apprezzabile differenza di età tra la roccia studiata e la vicina granodiorite del Monte Capanne.

[1] G. MARINELLI, Atti Soc. tosc. Sci. nat. *66*, 50 (1959).
[2] L. TREVISAN, Boll. Soc. geol. ital. *70*, 435 (1951).
[3] S. DEUTSCH, D. HIRSCHBERG, and E. PICCIOTTO, Bull. Soc. belge Géol. *65*, 267 (1956).
[4] S. DEUTSCH and A. LONGINELLI, Exper. *8*, 15 (1959).
[5] G. MERLA, Boll. Soc. geol. ital. *70*, 95 (1951).

Cyclisation of α-Benzylhomophthalic Acids

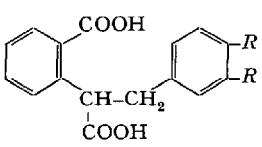
During the course of experiments on the synthesis of dibenzotropones, the cyclisation of some α-benzylhomophthalic acids were examined. α-Veratrylhomophthalic acid[1] (I), on treatment with polyphosphoric acid, readily afforded the keto acid (II, m. p. 211°C) which on decarboxylation to (III, m. p. 135°C) followed by dehydrogenation[2] with N-bromosuccinimide gave 2:3-dimethoxydibenzotropone (m. p. 131–132°C). The structure of (III) is confirmed by its independent synthesis from veratrylidenephthalide[3] following the synthetic course of TREIBS and KLINKHAMMER[2].

When 3:4-diethoxybenzylhomophthalic acid (IV, m.p. 169–170°C), readily available by reduction of 3:4-diethoxybenzylidenehomophthalic acid (m. p. 178–179°C), was cyclised a mixture of the keto acid (V, m. p. 165°C) and

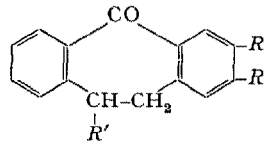
[1] NG. PH. BUU HOÏ, C. R. Acad. Sci., Paris *218*, 942 (1944).
[2] W. TREIBS and H. J. KLINKHAMMER, Chem. Ber. *84*, 671 (1951).
[3] K. KODAMA, J. pharm. Soc. Japan *63*, 54 (1943).
[4] J. N. CHATTERJEA, Chem. Ber. *91*, 2636 (1958).
[5] W. BONTHRONE and D. H. REID, J. chem. Soc., London *1959*, 2773.

an alkali-insoluble compound, $C_{20}H_{18}O_4$ (m. p. 176–177°C) resulted. The latter is identified as the diethoxyindeno*iso*coumarin (VI). α-Benzylhomophthalic acid itself afforded only the *iso*coumarin (VII, m. p. 173°C) on cyclisation. This structure is confirmed by the sharp lactone carbonyl absorption at 5·78 μ (KBr pellett) and by conversion into 1:2-Benzo-4-azafluorene (m. p. 163–164°C; picrate, m. p. 234–235°C) by conventional methods. Further, reduction of the *iso*coumarin (VII) by lithium aluminium hydride[4] gave the related *iso*chromene (m. p. 103–104°C) which was readily converted into indeno-(3′:2′-3:4)-*iso*-benzopyrylium perchlorate (m. p. 197–199°C) by treatment with triphenylmethylperchlorate in acetic acid[5].

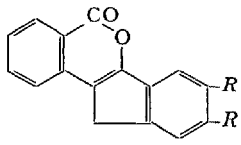
Other substituted benzylhomophthalic acids so far examined have afforded only the indeno*iso*coumarins.



I R = OMe
IV R = OEt



II R = OMe, R' = COOH
III R = OMe, R' = H
V R = OEt, R' = COOH



VI R = OEt
VII R = H

J. N. CHATTERJEA, H. MUKHERJEE

Chemical Laboratory, Science College, Patna (India), February 17, 1960.

Résumé

Les cyclisations des acides α-benzylhomophthaliques ont produit un keto-acide à 7 termes, un indenoisocoumarin ou un mélange des deux.

Chromosome Mechanism in *Polididus armatissimus* (Reduviidae-Heteroptera)

The genus *Polididus* has so far been known[1,2] cytologically by only a single species, *Polididus armatissimus*. The diploid number of chromosomes in this species is twelve, which includes a typical XY pair of sex chromosomes. The latter are of almost equal size and behave post-reductionally during meiosis. This chromosome number is the lowest among all the reduviids so far investigated which are otherwise characterised by the presence of a multiple X chromosome and a high number of chromosomes varying from twenty-three to thirty-two. Only in a few exceptional cases is the X simple. On account of the simple XY sex-determining mechanism and the lowest number of chromosomes, the *Polididus* constitutes an interesting material for cytological investigations.

During the studies on the chromosomes of Indian Heteroptera, the author[3–5] happened to examine *Polididus armatissimus* which was found to differ markedly in its karyotype from that already described[1,2].

At the spermatogonial metaphase (Fig. 1) there are fourteen chromosomes out of which two pairs can be distinguished as rod-shaped from the remaining ten more or less round ones. The eight elements at the metaphase of the first meiotic division (Fig. 2) form the typical reduviid pattern—the six autosomal bivalents forming a ring, slightly outside which are the two sex chromosomes, X and Y. The sex chromosomes reveal only a slight difference in size among themselves. The metaphase of the second meiotic division (Fig. 3) also presents six autosomal elements forming a ring sorrounding the centrally placed 'pseudo-bivalent' formed by X and Y. The two components of the 'pseudo-bivalent' differ slightly in their size (Fig. 4).

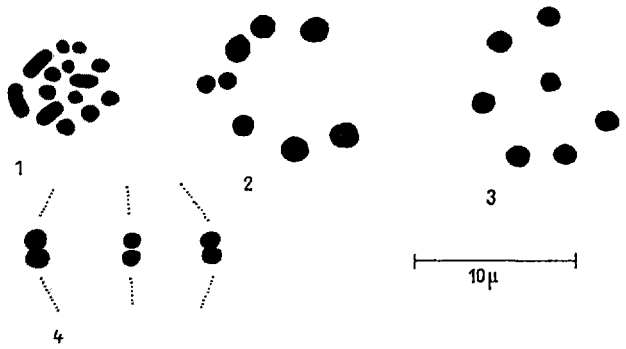


Fig. 1. Spermatogonial metaphase (polar view). Fig. 2. Metaphase I (polar view). Fig. 3. Metaphase II (polar view). Fig. 4. Metaphase II (side view), only three elements are shown.

Utilising the chromosome data to establish the phylogenetic relationship in the various families of Heteroptera, MANNA[6] and BANERJEE[2] conclude that the number '12 + XY' represents the primitive karyotype in Heteroptera and that the evolution of Reduviidae from Lygaeoidea has been accompanied by an increase in the basic number of chromosomes and a change from a simple X to multiple X condition. Such an assumption would point to the primitive nature of the karyotype in the genus *Polididus*, where the '12 + XY' condition appears to have survived as such. From the facts that, in the various species of the family Reduviidae with multiple X chromosome, the size of the Y is quite large as compared with those of the Xs, and that the sizes of the individual Xs decrease as their number increases, it may be concluded, as already suggested by TROEDSSON[7], that the increase in the number of Xs in the family has been accomplished by the fragmentation of the original X. The more or less equal size of X and Y in the genus *Polididus*, thus further supports the primitive nature of its karyotype amongst the reduviids.

S. S. JANDE[8]

Department of Zoology, Panjab University, Hoshiarpur (India), February 23, 1960.

[1] TOSHIOKA, Konchu *10* (1936). Quoted from S. MAKINO, *An Atlas of Chromosome Numbers in Animals* (Iowa State College Press, Ames 1950).
[2] M. R. BANERJEE, Proc. zool. Soc. *11*, 9 (1958).
[3] S. S. JANDE, Res. Bull. Panj. Univ. *10*, 25 (1959).
[4] S. S. JANDE, Res. Bull. Panj. Univ. *10*, 215 (1959).
[5] S. S. JANDE, Res. Bull. Panj. Univ., *10*, 415 (1959).
[6] G. K. MANNA, Proc. 10th Int. Congr. Ent. Canada *2*, 919 (1956).
[7] P. H. TROEDSSON, J. Morph. *75*, 103 (1944).
[8] Now at Chandigath.