11. SYMMETRY OPERATIONS ON THE C60 FULLERENE/BENZOL SOLUTION REVEALED BIOPOLYMER STRUCTURES

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Short communication

The first TEM data were published previously on partially degraded wall of *Botryococcus braunii* KÜTZ. with C60 fullerene/benzol solution (KEDVES and FREY, 2002). Later this solvent was applied for different kind of recent pollen grains. During our experimental investigations on the pollen grains of *Taxus baccata* L. (KEDVES, PÁRDUTZ, JACSÓ, KOCSICSKA and VARGA, under publication) one experiment revealed different kinds of biopolymer units in angstrom dimension. Regular hexagon connected with a regular pentagon was also observed. Our first results on the symmetry operations in this subject are summarized as follows:

1. The verification of the symmetry of the hexagonal biopolymer unit, connected with a pentagon was succesful (Plate 11.1.). Several secondary points of symmetry appeared, which may be used for further symmetry operations.

2. Five and tenfold primary rotation was used for another single, regular pentagon (Plate 11.2.). Secondary rotations were also used (cf. KEDVES, 1989). The alterations of the rotation areas are more or less regular. Worth of mentioning that the secondary rotations have not resulted the Penrose unit. In this way it may be presumed that the regular pentagon without connections may be a component of a disintegrated large biopolymer structure of C60 fullerene type.

Finally, we may emphasize, that the first attempts concerning the symmetry operations of the biopolymer structures, revealed with the C60 fullerene/benzol solution was succesful.

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References

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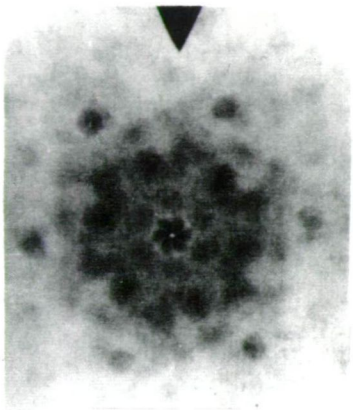

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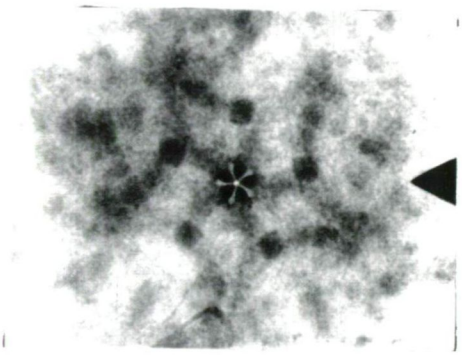

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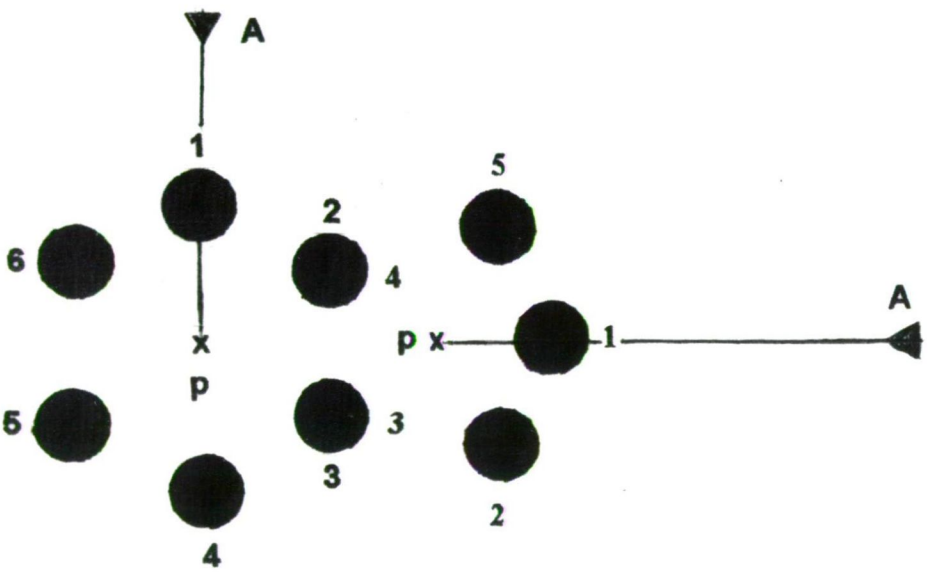

Plate 11.1

Scheme of the hexagonal biopolymer unit connected with a regular pentagon and the axes of rotation. We emphasize the importance of the two common biopolymer units of the hexagon and pentagon. (Magnification of this schema: 2.5 Million).
The six- and tenfold primary rotation pictures. N : 500.000x. Worth of mentioning are the secondary points of symmetry.

Plate 11.2.

Scheme of another single regular pentagon of 2.5 Million magnification. Fivefold and tenfold primary rotations, and altogether six secondary rotation pictures of 500.000 magnification are presented herein. There are several secondary points of symmetry are illustrated.

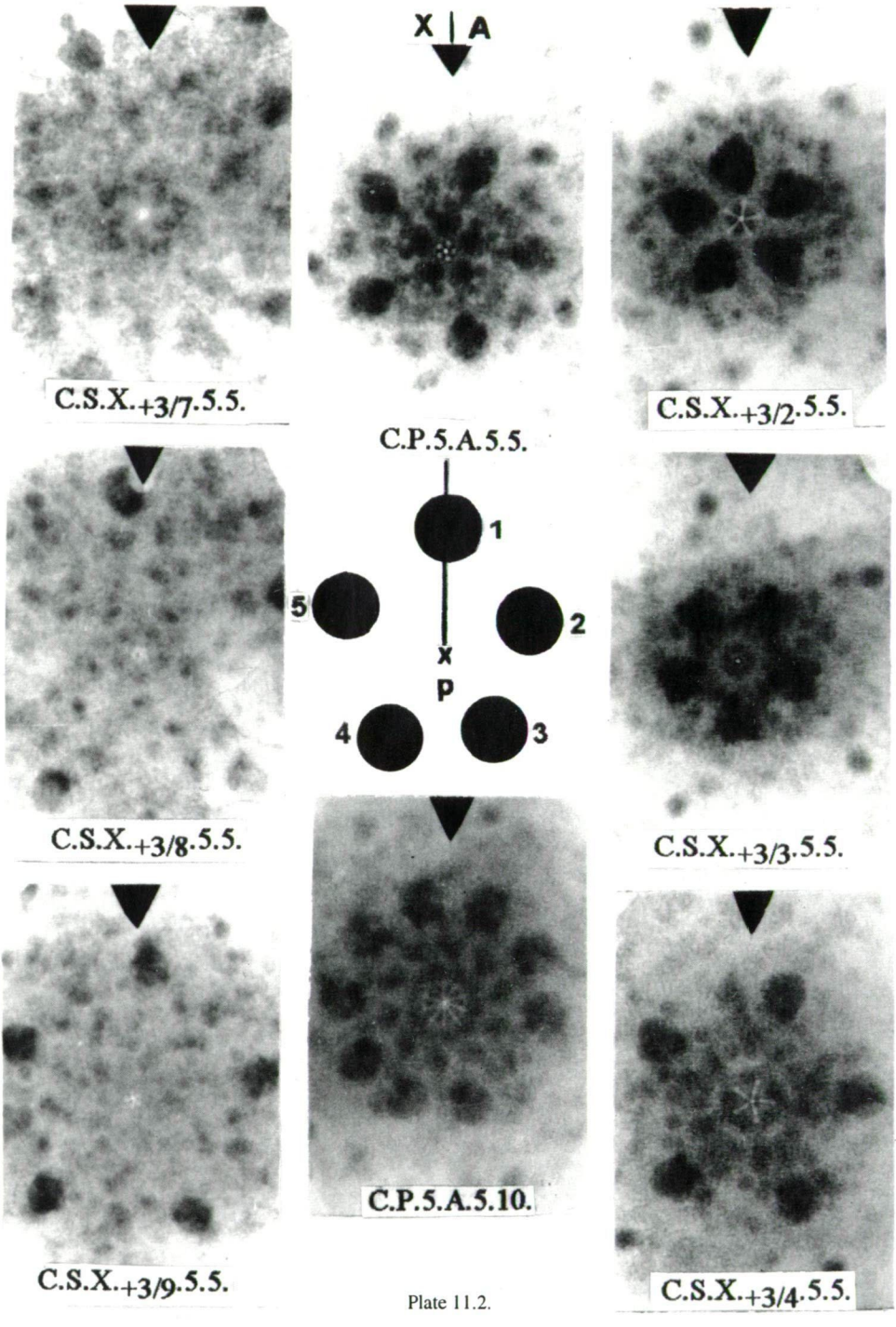
X | A
C.S.X.+3/7.5.5.
C.P.5.A.5.5.
C.S.X.+3/2.5.5.
1
2
3
4
5
X
P
C.S.X.+3/8.5.5.
C.S.X.+3/3.5.5.
C.P.5.A.5.10.
C.S.X.+3/9.5.5.
C.S.X.+3/4.5.5.

Plate 11.2.