3. BASIS OF THE TERTIARY ROTATION AND TICOS MODELLING OF THE QUASI-CRYSTALLOID BIOPOLYMER SKELETON OF THE PLANT CELL

Short communication

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A short review concerning the discovery and the basic elements of the quasi-crystalloid skeleton of the partially degraded pollen exines is presented in paper No 4. The first methodical concepts and the most important first statements of TICOS modelling are also presented in this paper. The methodical elaboration with the first new results of the tertiary rotations was published a long time ago (KEDVES et al.). In this way it seemed to be important to present the basic statements of this kinds of rotations but by the developed form, and using the establishments of the results of TICOS modelling.

As it was emphasized in the paper under publication, after the demonstration of the so-called basic PENROSE-unit with the secondary rotation, "the further problem was evident: Is it a way to demonstrate the "second stage" of PENROSE-system (1979, p. 32, fig. 2) or at least space-equivalent organization from the biopolymer system of the plant cell wall" To get information about this problem the tertiary rotation method was elaborated. The basis for this kind of rotation is the scheme of a basic PENROSE-unit which resulted after a secondary rotation.

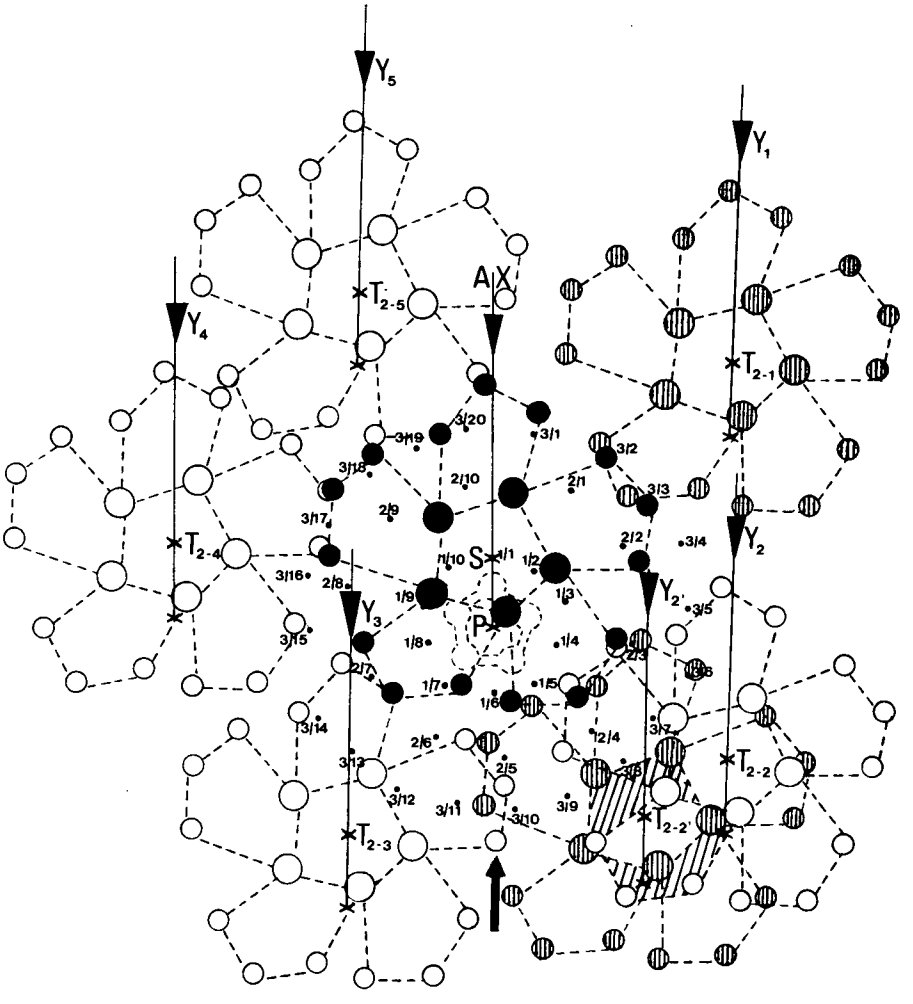
In text-fig. 3.1. we tried to join other PENROSE-like biopolymer units to the basic one taking our principles into consideration. The principle was the following:

1. The axes are parallel (Text-fig. 3.1.)
2. The two not perfectly connected points are as near as possible.

The first PENROSE-like biopolymer unit joined to the basic one fit defectively. We noticed our mistake and corrected it but we left it in the picture and indicated the first version by lining the little circles. The basic PENROSE-like biopolymer unit is black. The above mentioned mistake resulted that TICOS published in detail in the next communication bear this number. It is indicated by lining, too.

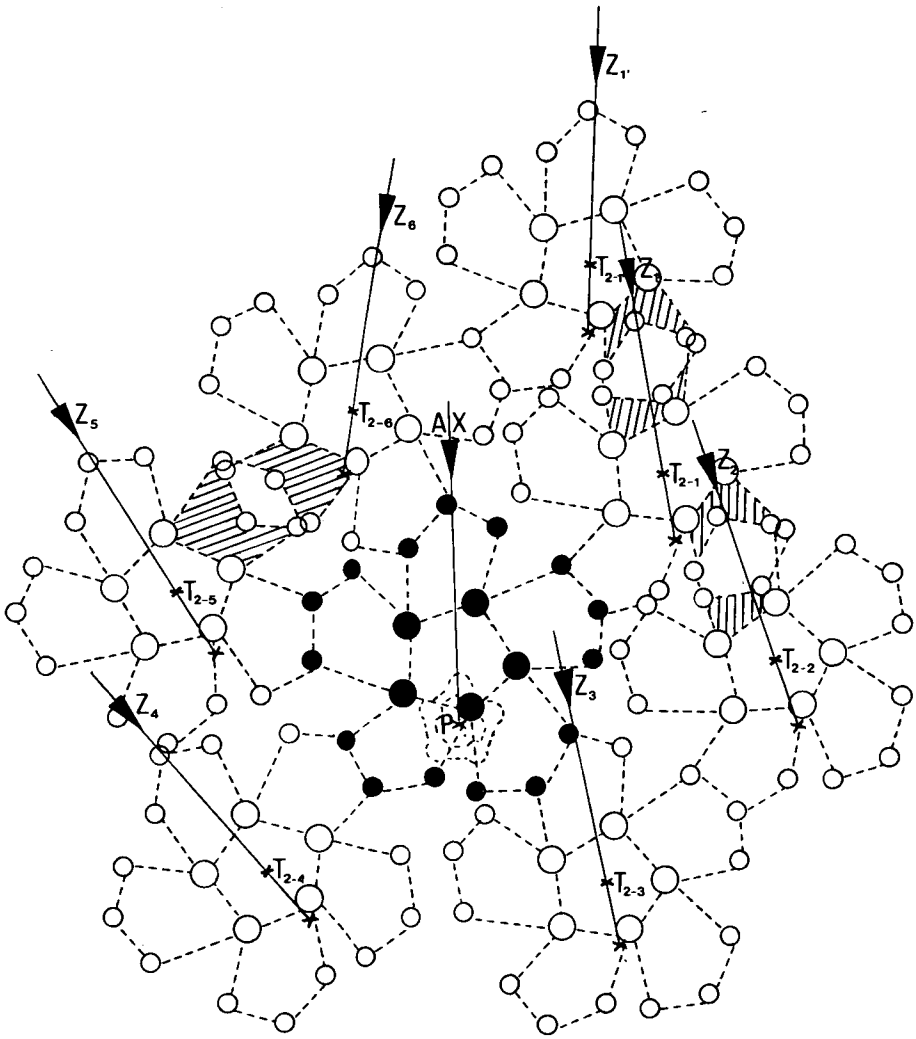
We can observe a TICOS under development marked with an arrow. This is produced by the above mentioned mistake.

In text-fig. 3.2. we joined the other PENROSE-like biopolymer units again to the basic one but the two points of contact covered each other perfectly. It resulted that the axes weren't paralell. In this case TICOS models were observed. We joined a sixth PENROSE-like biopolymer to the skeleton which produced a third TICOS. The three TICOS models are indicated by lining.



Text-fig. 3.1.

The basic PENROSE-like biopolymer is surrounded by five others. In this case the axes are parallel and the connection of the PENROSE-units is not perfect.

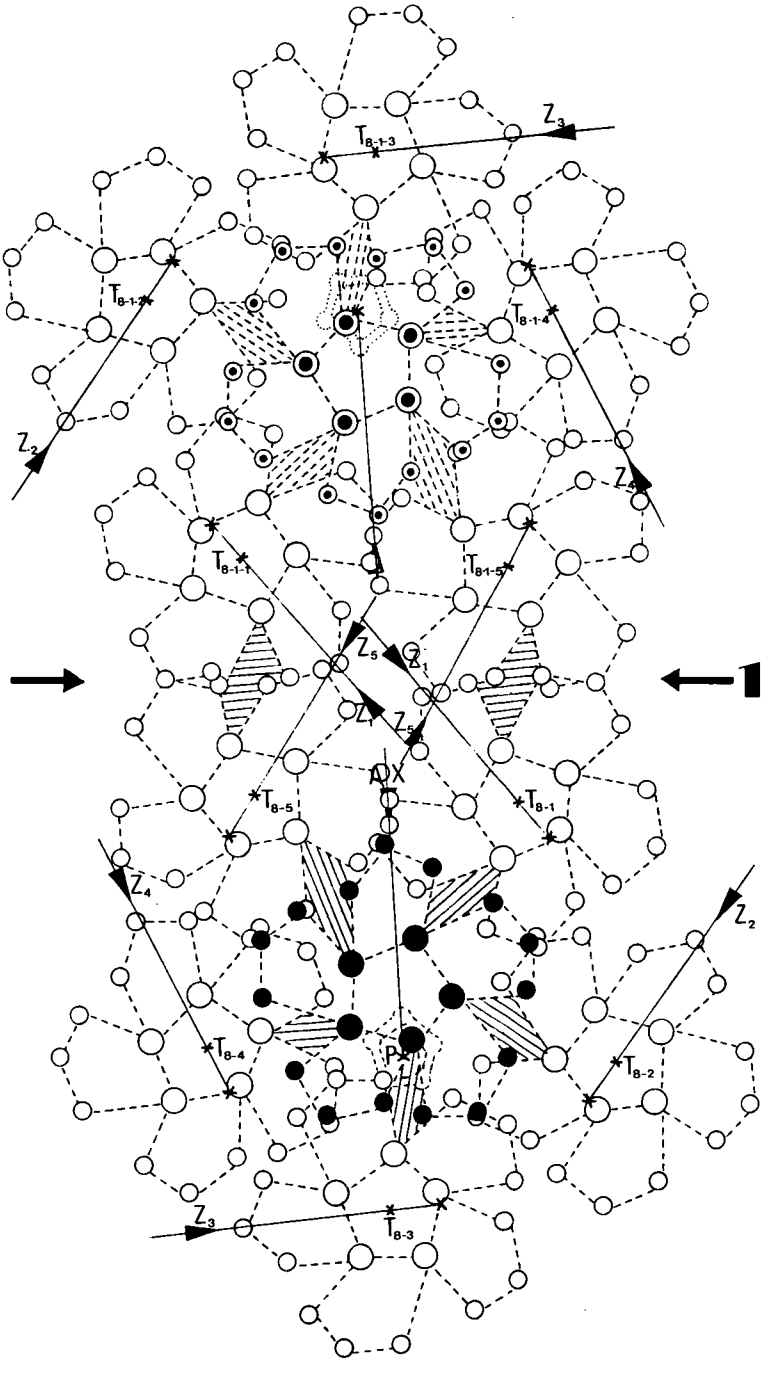


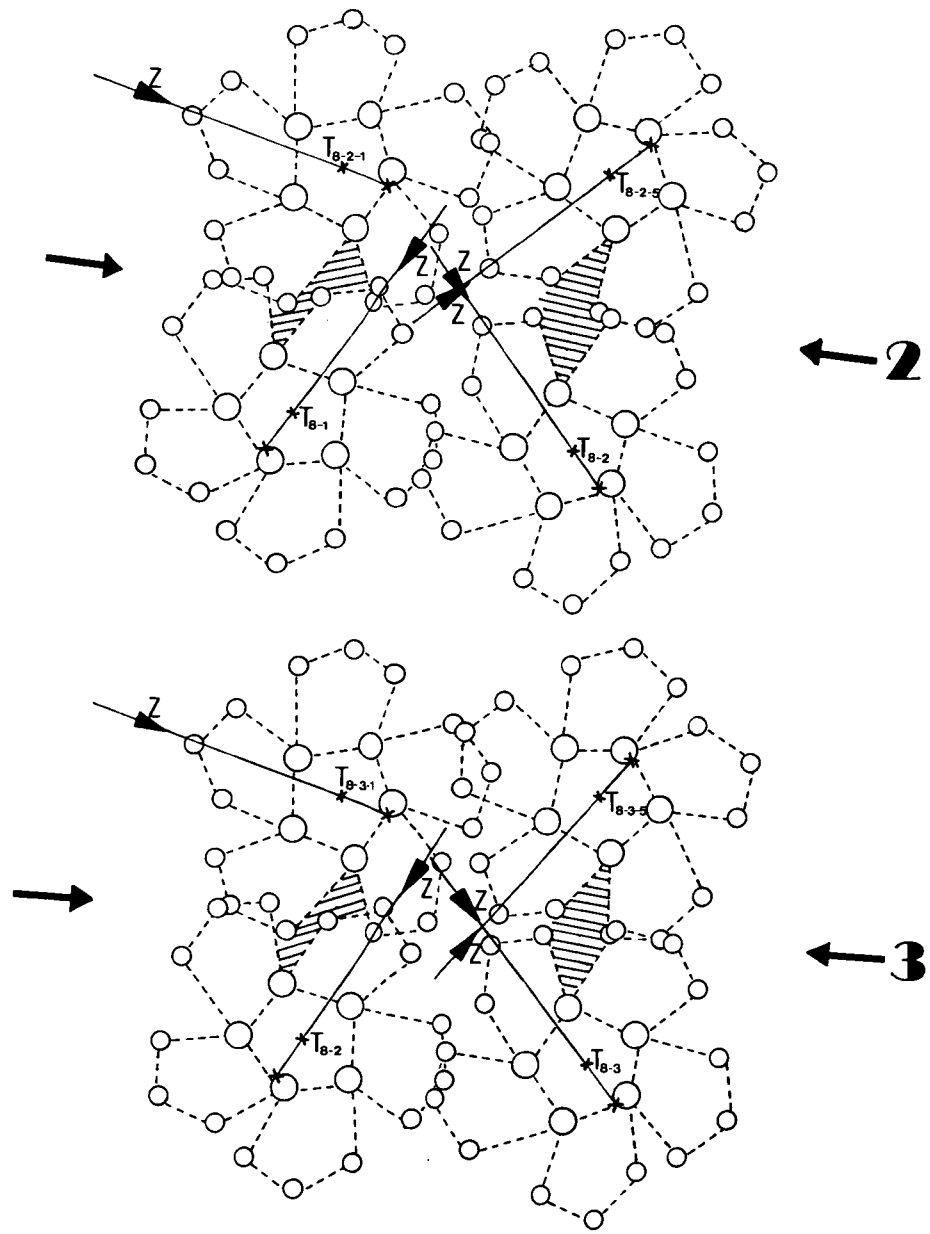
Text-fig. 3.2.

In this case the units cover each other perfectly and the axes are not parallel. Three TICOS models are produced.

Text-fig. 3.3.

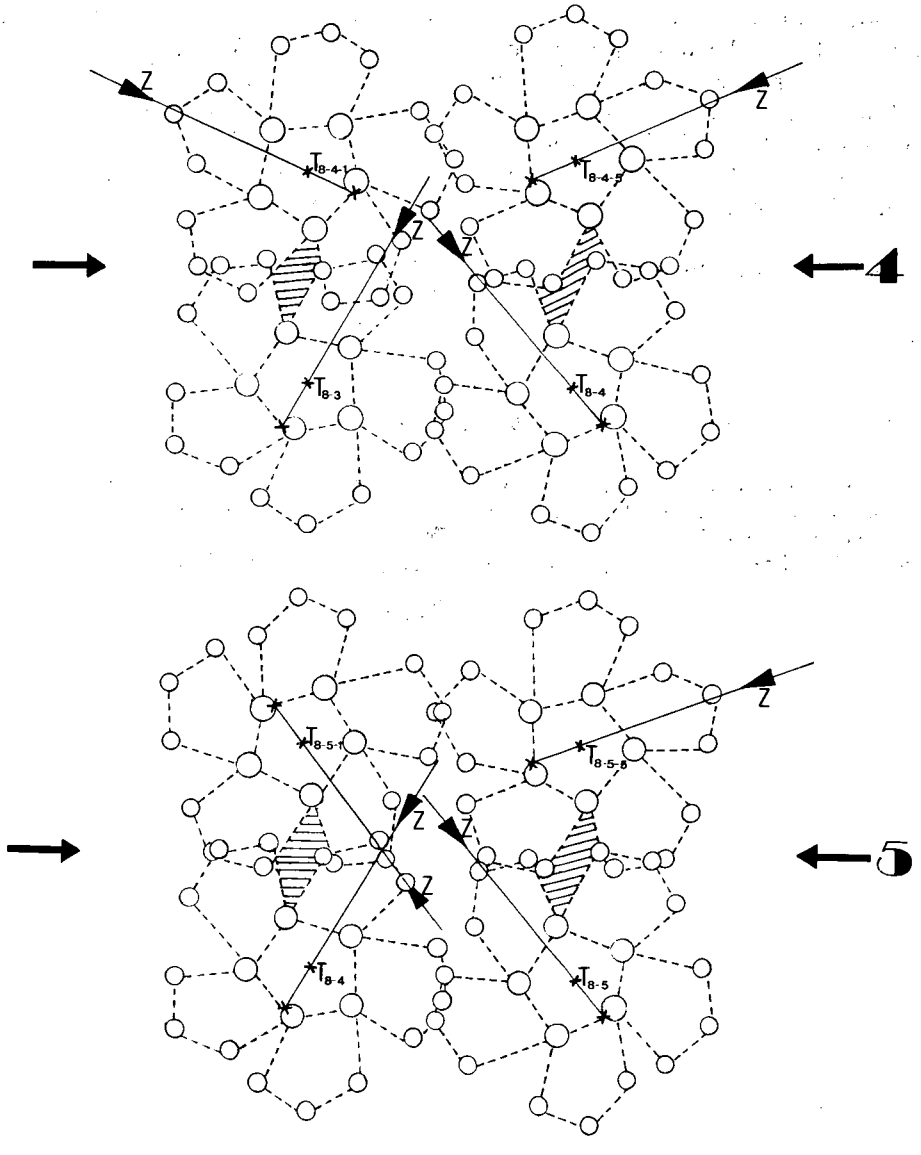
The PENROSE-like biopolymer units are joined by four points of contact. It resulted in five rhombuses. Two whole skeleton is connected.


Z3
T8-1-3
T8-1-2
T8-1-4
Z2
Z4
T8-1-1
T8-1-5
Z5
Z1
Z1
Z5
O
X
T8-5
T8-1
Z4
Z2
T8-4
T8-2
P
Z3
T8-3



Text-fig. 3.4.

It indicates the connection of the two skeletons at two skeletons at two more sides.



Text-fig. 3.5.

Two more kinds of joint can be seen in this scheme.

Our third examination resulted in text-fig. 3.3. In this picture we tried to get four points to cover each other. Of course it is impossible but they are as near as possible. This arrangement resulted five rhombuses marked by lining, too.

After this we joined a skeleton corresponding to the original to the above mentioned one. The number of the points of contact is eight. This attempt produced two more rhombuses indicated by lining. The joined skeleton is marked by spots in the little circles of its PENROSE-like basic biopolymer unit. It was performed at four more sides of the original skeleton (Text-fig. 3.4. and 3.5.). In the figures only the four connected PENROSE-like units of the skeletons are indicated. All of them produced the same result.

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References

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