ON THE POSSIBLE STRUCTURAL DIFFERENCES BETWEEN MOLECULES PRESENT IN NATURAL EXTRACTS AND SYNTHETIC ONES

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INTRODUCTION
Some discrepancies are sometimes observed in a different biological activity of the same molecule present in natural substrates and those extracted from phytocomplex or produced by synthesis. In the last two cases a lower activity is sometimes observed, as described for quercitin and hypericin in Hypericum perforatum, artemisin in Artemisia annua, Vitamin C and Flavonoids in Citrus x limon. This behaviour has been usually ascribed to synergic effects with other molecular species present in the natural product, but a further hypothesis can be taken into account, i.e. that the different activity could originate from a different structure, at conformational level, of the active compound when present in the biological substrate, due to interactions with other molecular species and/or with oligoelements.

THEN: SYNERGISM OF INTERMOLECULAR INTERACTIONS?
Intermolecular interactions occur between all types of molecules or ions in all states of matter. They range from the strong, long-distance electrical attractions and repulsions between ions to the relatively weak dispersion forces which have not yet been completely explained. The various types of interactions are classified as (in order of decreasing strenght of the interactions):

- ion-dipole
- ion-induced dipole
- dipole-induced dipole
- hydrogen bonding
- dispersion forces

Without these interactions, the condensed forms of matter (liquids and solids) would not exist except at extremely low temperatures. Just to give an idea of the strenght of the intermolecular forces, the dissociation energy of a dipole-dipole couples is in the range 0.5-2 kcal, while that of hydrogen bonds grows up to 12-16 kcal. Comparing these values with the dissociation energy of a covalent bond (in the order of magnitude of 400 kcal) these interactions appear to be relevant.

REFERENCES: