

Natural product-based nano-emulsions: mechanism, applications and perspectives

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Nano-emulsions are kinetically stable systems due to the small diameter of droplets. They offer advantages regarding improvement of water availability (oil in water systems), possibility to enhance the chemical stability, controlled release, and others. Natural products can be found as complex mixtures that can be used directly as an oily phase and a source of bioactive compounds on the nano-emulsion. On this case, the diversity of compounds and their differences regarding the molecular/physicochemical properties can lead to desirable unconventional behavior, when compared to classical colloidal systems prepared with synthetic and/or less complex oily phases. A wide range of studies have been reported with natural product-based nano-emulsions in different areas, including for preparation of ecofriendly insecticides, nutraceuticals and phytotherapies. They are still in spotlight of novelty and this is an open field of innovation. Understanding the mechanisms of generation, stabilization and applications of these nano-emulsions may be the beginning of a new approach for natural products, through a true chemical of phytocolloids.