Melaleuca alternifolia or commonly known as tea tree is a tall shrub or small tree in the plant genus Melaleuca. It is popular for its oil, which is tea tree oil where it has been employed largely in various industries of its antimicrobial properties. Research works are still ongoing mainly focusing on the tea tree oil properties, ultimately almost none of them investigating on the residue which is the leaves. Environmental issues become the world major concern, which create awareness among industrial player to turn back to natural fibre in producing products. In recent time, productions of composites from agro waste have received considerable attention. This paper aims to rationalize the potential of tea tree (Melaleuca alternifolia) leaves as a new source of natural fibres or material in order to become the potential filler or reinforcer in the development of a new biocomposite.