ABSTRACT
Monoamine oxidases (MAO) are widely distributed enzymes among mammals, plants, and prokaryotic and eukaryotic microorganisms that catalyze oxidatively amines to aldehydes. In recent years, there has been considerable renewed interest in MAOs with respect to the key roles played by these two MAO isoforms (MAO-A and MAO-B), which differ in substrate specificity, sensitivity to inhibitors and amino acid sequence. MAO-A preferentially oxidizes NA and 5HT, and is selectively inhibited by clorgyline, whereas MAO-B preferentially deaminates PEA and benzylamine, and is irreversibly inhibited by L-deprenyl. DA, tyramine and tryptamine are non-selective substrates for MAO-A and B. Many researchers have shown interest in the study of MAO inhibitors, particularly to the observation that selective and reversible inhibitors of MAO-A or MAO-B may be useful therapeutic agents without undesirable side-effects, such as the so-called 'cheese effect', for the treatment of several psychiatric and neurological diseases. In humans MAO-B inhibitors are used as coadjuvants in the treatment of Parkinson's disease and Alzheimer's disease, while MAO-A inhibitors are used as antidepressant and antianxiety agents. Among the different existing inhibitors, those with heterocycles containing 2 or 4 nitrogen atoms have recently been developed as lead compounds for the design of reversible and selective monoamine oxidase inhibitors (MAOIs-A and MAOIs-B). In particular oxadiazolone, tetrazole, oxadiazinone, and indenopyridazine derivatives have been studied as potent, reversible, and selective MAO-B inhibitors. Keeping above facts in minds, we have designed and synthesized novel heterocyclic compounds as MAO inhibitors.