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Nitrogen-Containing Heterocycles in Agrochemicals

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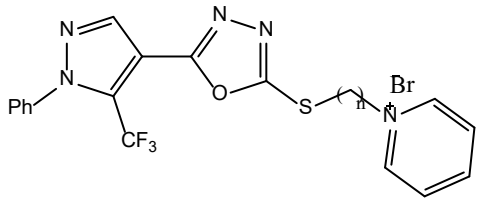
Introduction

Nitrogen-Containing heterocyclic compounds are the most abundant and integral scaffolds that occur in a variety of synthetic drugs, bioactive natural products, pharmaceuticals and agrochemicals.

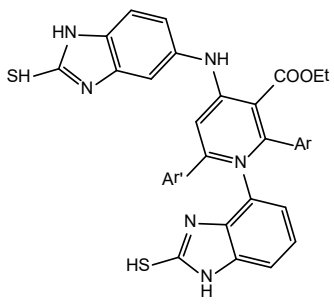
Lei Zhou et al. [1] reported the synthesis and the bacterial activity of pyridinium -5- trifluoro-methylpyrazoles (1_{a-f}) bearing 1,3,4 oxadiazole moiety . These thioethers exhibited significant inhibitory activity against pathogenic bacteria Xanthamonas oryzae *pv.* oryzae (Xoo), *Ralstonia solanacearum* and *Xanthomonas axonopodis pv.*citri (Xac).



n=3,4,6,8,10,12

(1_{a-f})

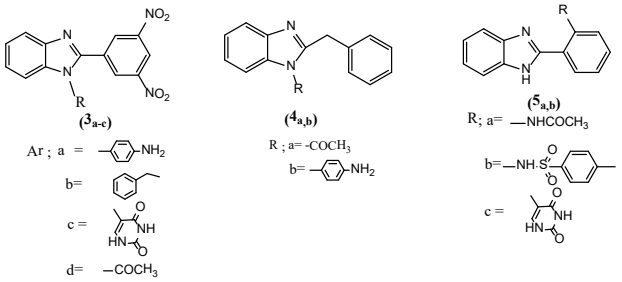
Benzo[d] imidazolyl tetrahydropyridine carboxylates (2_{a-c}) have been prepared and were evaluated for their antifungal activity against *Aspergillus niger* (ATCC 16404). These compounds are significally toxic toward the fungi. Compounds with the electron- donating methoxy group on the phenyl ring are highly toxic [2].



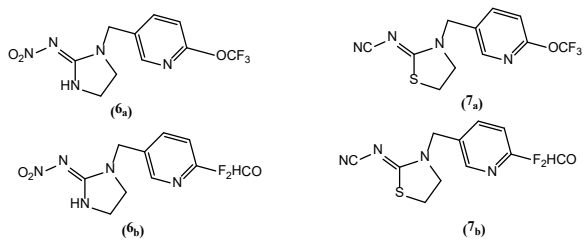
(2_{a-c})

a; Ar=C_6H_5 Ar'=4-$OCH_3C_6H_4$ b; Ar=C_6H_5 Ar'=2-$OCH_3C_6H_4$ c; Ar=2-ClC_6H_5 Ar'=2-$OCH_3C_6H_4$

Olyinka O Ajani et al. [3] synthesized benzimidazole derivatives by ecofriendly method and examined their antimicrobial properties for future drug and agrochemical developments. large zones of inhibition were noticed for compounds (3_{a-c}) and (4_a) against Bacillus Licheniformis, compounds ($3_{b,d}$), (4_b) and ($5_{a,b}$) against *Proteus Vulgaris* and compounds (3_{a-c}), (4_a) and (5_c) against *Pseudomnas acruginosa*.



Gregory Landellea et al. [4] reported the synthesis of imidacloprid and thiacloprid containing either 6- trifluoromethoxy or 6-difluoromethoxy –pyridin-3-yl methyl moieties ($6_{a,b}$) and ($7_{a,b}$), respectively. F_2HCO-Imidacloprid (6_b) is more active *in vivo* against green-peach aphid (*M. persicae*) than F_3CO derivatives (6_a), both derivatives are less active than imidacloprid. F_3CO-Thiacloprid (7_a) is more active in vivo against *M. persicae* than (7_b). Both derivatives ($7_{a,b}$) are much less active than thiacloprid.



Compounds ($2_{a,b}$) inhibit 14-α demethylase in sterol biosynthesis pathway of the fungi 2018.

Stephan et al. [5] synthesized 4-(2,5-dichlorothiophen-3-yl)-1,3-dithiolan-2-ylidene)methyl)-1H-imidazole derivatives ($8_{a,b}$)

inhibited 14-α-demethylylase in the sterol biosynthesis pathway of the fungi.

($8_{a,b}$)

The above investigations open the route to a new acess to bioactive ingredients and their further evaluation, which could possibly lead to large activity enhancements.

References

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