6 SUMMARY AND CONCLUSIONS

Authenticated plant samples were subjected to successive extraction with PE, CHCl₃, EtOAc and MeOH. PE extracts was partitioned with acetone to get acetone soluble and acetone insoluble PE extracts. PE, CHCl₃, EtOAc extracts of bark and acetone insoluble fraction of PE extract of leaf was subjected to isolation study using silica gel CC. The structure elucidation of isolated compounds was done by using spectroscopic techniques like ¹H-NMR, ¹³C-NMR, MS, IR, and UV.

The PE extract of bark afforded five compounds. The isolated and characterized compounds include triterpenoids- lup-19(29)-ene (1) and lupeol (2); long chain hydrocarbons- lauric acid (Decanoic acid) (3), and methyl tetracosanoate (4). β-sitosterol (5) was identified by HPTLC. The CHCl₃ extract of bark afforded three compounds namely coumarins- bergapten (6), 4(2,3-dihydro-geranylxy)-5(4(2,3-dihydro-geranylxy)phenyl-bergapten (7) and triterpenoid acid- echinocystic acid (8). The EtOAc extract of bark subjected to repeated column chromatography afforded five compounds which include flavonoids- 3’-prenylapigenine (9), 2-(4-hydroxy-3,5-bisisoprenyl)-8,8-dimethyl[2,3]pyrano)flavanone (10), 2(8'8'-dimethyl[2,3]pyrano-3H,4H-cyclohexane)flavanone (11), 2-(3’-isoprenyl)-4-oxocyclohexyl)-4H-chromene-4,5,7(4aH,6H)-trione (12), and apigenin (13). Catechin (14) was confirmed in EtOAc extract of bark by HPLC and Co-TLC. Acetone insoluble fraction of PE extract of leaves afforded long chain hydrocarbons- nonacosane (15), heptacosane (16), triacontanol (17), and octacosanol (18). Catechin (14) and chlorogenic acid (19) were confirmed in EtOAc and MeOH extracts of leaves, respectively by HPLC and Co-TLC. Chemical structures of all isolated phytoconstituents from wood bark and leaves are shown in Fig. 6.1 and 6.2.

HPLC method was developed and validated for the quantitative determination of coumarin bergapten in P. dulce. The developed methods could also be used for the quantitative analysis and quality control of extracts and commercial samples of other species containing bergapten. Extraction efficiency of CHCl₃ solvent for different extraction techniques was studied. Microwave assisted extraction was found to be efficient and fastest techniques of other conventional methods like Soxhlet apparatus extraction, hot reflux extraction, maceration, and ultrasonic assisted extraction.
P. dulce wood bark and leaves extract demonstrates good α-glucosidase and α-amylase inhibitory activity. The extracts have the dual advantage of having α-glucosidase and pancreatic α-amylase inhibitor action hence could prove to be an effective treatment for diabetes mellitus. The bark and leaf extracts of P. dulce contains good amounts of flavonoids and phenolic compounds, exhibits high antioxidant and free radical scavenging activities. It also posses iron chelating and reducing power. These in vitro assays indicate that this plant extract is a significant source of natural antioxidant, which might be helpful in preventing the progress of various oxidative stresses.

Figure 6.1: Chemical structures of isolated phytoconstituents from wood bark.
Figure 6.2: Chemical structures of isolated phytoconstituents from leaves.
7 SCOPES FOR FUTURE WORK

The scope of future may include the following:

- Phytoconstituents isolation from CHCl₃, EtOAc and MeOH extract of leaves.
- HPLC quantification and method validation for other important phytoconstituents.
- Pharmacological evaluation of isolated phytoconstituents for diabetic potential.
- Developed HPLC method for bergapten can be used for analysis of marketed formulations containing bergapten.