ISSN:2229-6107

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY

E-mail :
editor.ijpast@gmail.com
editor@ijpast.in

www.ijpast.in

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

Natural Chloroform: A Review and Update

Ms. Nayela Ghazal[1], Dr. Kona Shravan Kumar[2], Mrs.Anitha Surakala[3]

ABSTRACT: An important source of secondary metabolites is plants.Plants provide a wealth of useful compounds, including several that are cytoprotective, natural, and therapeutic. Among the many significant secondary metabolites, chalcones stand out. Foods, vegetables, tea, spices, and other natural products are a good source of modulatory and pharmacological compounds.In flavonoid biosynthesis, chalcones play an essential mediating role, but they do not accumulate to a significant level.throughout the plant kingdom.Several disorders may be amenable to the cytoprotective and modulatory effects of the chalcones, a class of polyphenolic chemicals generated from plants that are members of the flavonoids family. The majority of naturally occurring chalcones have been found in plants belonging to the Leguminosae, Asteraceae, and Moraceae families. The E-antimicrobial, antifungal, anti-mycobacterial, antimalarial, antiviral, anti-inflammatory, antioxidant, anti-tumor, antiileishmanial, and anticancer activities of chalcones and their derivatives have made them widely employed in traditional medicine.

In this review, we will take a look at the many chalcone compounds found in nature and how scientists have been working to find new ones, as well as the pharmacological screening of chalcones, the research of their biological activities, and their significance.

Keywords: Chalcones,Secondarymetabolites phytochemicals screening

INTRODUCTION:

A class of chemicals found in many plants, chalcones are phenolic or flavonoid. 1. They play an important role in flavonoid production as both an intermediate and an end product. 2. They are defensive chemicals that interact with pathogens and contribute to the therapeutic efficacy of herbs. 3. There is a vast array of biological functions shown by both naturally occurring chalcones and their synthesized derivatives 3. This is why chalcones are attracting more and more attention from the scientific community.

One of the first steps in the production of flavonoids and isoflavonoids, chalcones are members of the biggest group of secondary metabolites found in plants. As a protective strategy, they help plants fend off harmful microbes, insects, and animals by reducing the effects of reactive oxygen species. 6. From a chemical standpoint, chalcones, also known as 1,3-diaryl-2-propen-1-one Fig. 1, are open chain flavonoids. These flavonoids have an α, β-unsaturated carbonyl system and are composed of two aromatic benzene rings connected by a three-carbon enone molecule.

Associate professor[1,2], Assistant professor[3]

Department of Pharmaceutical Chemistry

Global College of Pharmacy, Hyderabad. Chilkur (V), Moinabad (M), Telangana- 501504.

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

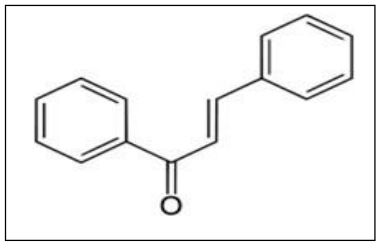
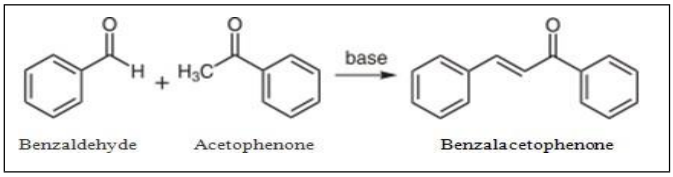


FIG.1:STRUCTUREOFCHALCONE

Synthetic Method of Preparing Chalcones: Although chalcones occur naturally, they could be available in larger amounts through an efficient synthesis method. Chalcones can be prepared by any two condensation reactions namely:**Claisen Schmidt Condensation:** The most convenient method is the Claisen-Schmidt condensationofequimolar quantitiesofaryl methyl ketone (acetophenone) with aryl aldehyde (benzaldehyde) in the presence of alcoholic alkali (sodium hydroxide) as a catalyst.



SCHEME 1: REACTION OF CLAISEN SCHMIDT CONDENSATION This method of reaction has been found withoutany solvent as a solid-state reaction. It can be used as an example of green chemistry synthesis in undergraduate education [8].

Aldol Condensation: Acetophenone and benzaldehyde are the starting materials for this reaction. First, acetophenone is treated with a base like KOH which converts it into the more active form, its enolate form.

It will then react with benzaldehyde to form intermediate. The intermediate will then lose water molecule by heat to form chalcone [9].

$$C_6H_5CO\text{-}CH_3 + O{=}CHC_6H_5 \rightarrow C_6H_5CO\text{-}CH{=}CHC_6H_5$$

Acetophenone Benzaldehyde Benzalacetophenone

SCHEME2:REACTIONOFALDOLCONDENSATION

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

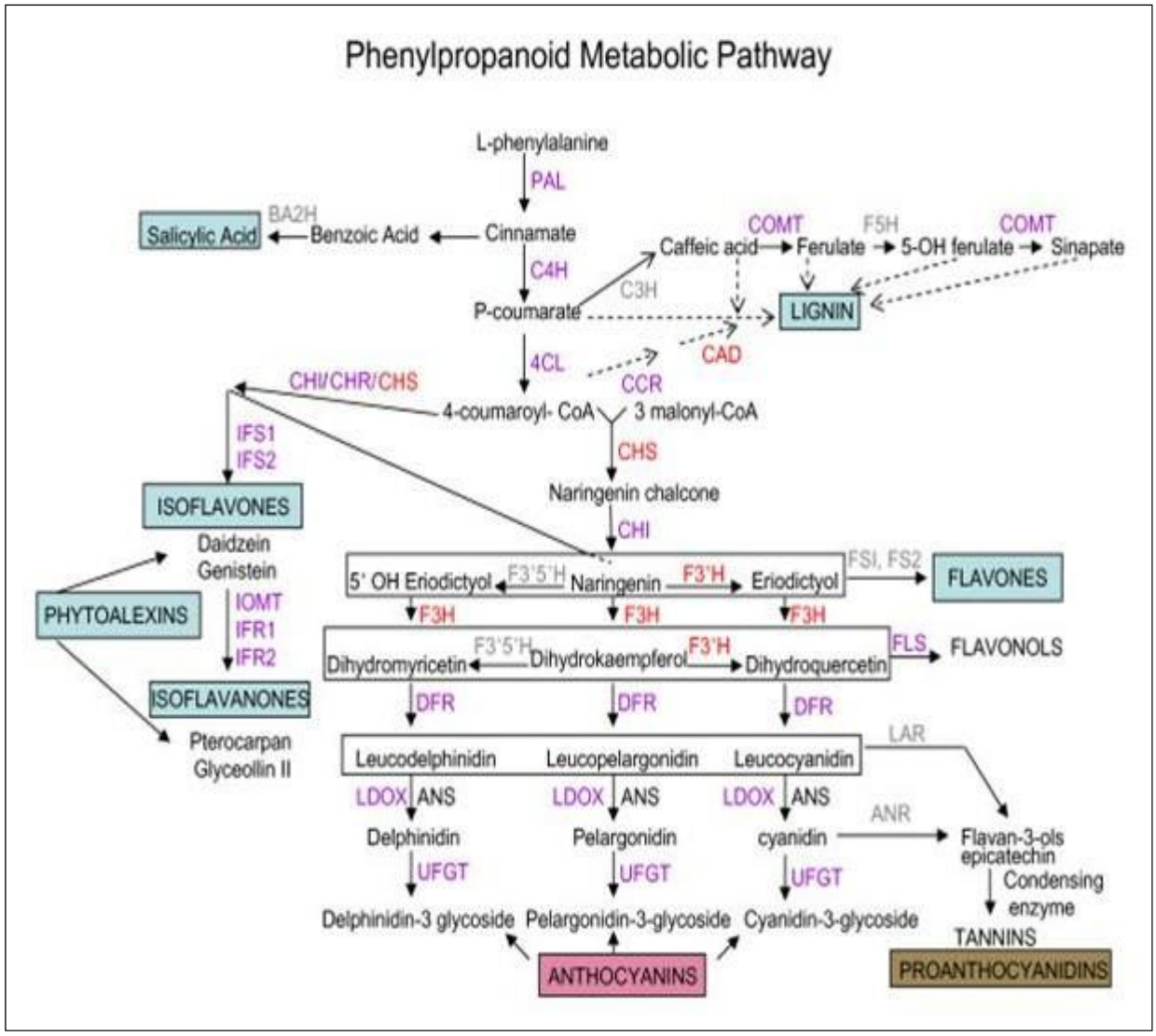


FIG.2:PHENYLPROPANOIDBIOSYNTHESISPATHWAY

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

Biosynthesis of Chalcones: Natural product components known as chalcones or benzylideneacetophenone have a wide range of biological and pharmacological effects. 10. By combining one molecule of p-coumaril-CoA with three molecules of malonyl-CoA, the enzyme Chalcone synthase creates chalcones in higher plants. An aromatic B-ring and the 3C bridge of chalcone (C6-C3-) are generated when the amino acid L-phenylalanine, which is synthesized in the shikimic acid route, is converted to p-coumaril-CoA via the phenylpropanoid pathway. Merging three molecules of malonyl-CoA (-C6) results in the formation of the aromatic A-ring.

There are three primary pathways in plant metabolism that chalcone takes after synthesis. In most circumstances, it may be transformed to naringenin by the action of Chalcone isomerase. It can also be used to make aurones by the Aureusidin synthase and to form glycosyl conjugates, which are yellow floral pigments that accumulate in plants. The 5-hydroxyflavanone naringenin is made by chalcone isomerase "type I," which is present in most higher plants (except from leguminous ones). This enzyme is essential for the biosynthesis of almost all flavonoids, including flavones, isoflavones, flavonols, condensed tannins, and anthocyanins.

Natural Occurrence of Chalcones: Isolated from Dydimocarpus aurentica 12 were aurentiacin A and aurentiacin B, which are 2-hydroxyl-4,6-dimethoxy-3-methylchalcone and 2,4-dihydroxy-5-methyl-17,6-methoxy chalcone, respectively. The ceroptin chemotype of Pityrogramma triangularis 13 produced an exudate farina that included the triangularin-2′, 6′-dihydroxy-4′-methoxy-3′-methylchalcone. The 2,4,6-trimethyl- 2- (3-phenylpropionyl)-cyclohexane-1,3, 5-trione and 2′,6′-dihydroxy-4′-methoxy-3′,5′-dimethyldihydrochalcone were isolated from Myrica gale fruits. 14 . The derris robusta seed shells yielded a novel chalcone, rubone, among other compounds. Dihydrofuranochalcone, a novel Bakuchalcone, was found in Psoralea corylifolia seeds. 16. The chalcone derivatives lapathinol, lapathone, angelafolone, valafolone, and melafolone were extracted from 17 different plants of the Polygonum lapathifolium species. The plant also yielded a novel isoflavone and a dihydrochalcone. The novel dimeric dihydrochalcone Brackenin was discovered

the zanguebarica branch of Brackenridgea 18. Isolated from the roots of Tephrosia woodii 19 are oaxacacin, a novel prenylated flavanone, and mixtecacin, its chalcone. From Helichrysum rugulosum 20, a complex combination of chalcones and flavanones, 1, 3, 4- trimethoxy derivatives, dimethylallyl groups, and methoxy derivatives was extracted. The leaves of Lindera umbellate 21 have yielded two dihydrochalcones: 2,4′,6′-trihydroxydihydrochalcone and 2′, 6′-dihydroxy-4′-methoxydihydrochalcone. Two chalcones, isoliquiritin and licuraside, were isolated from the root of the Glycyrrhizae plant.

Angelica keiskei 23 roots yielded four novel chalcones, xanthangelols B–E. The green portions and flower heads of Bidens tripartitus 24 were used to isolate 2'-hydroxy-4, 4-dimethoxychalcone. The root bark of Pongamia pinnata yielded two novel β-hydroxychalcones, ponganones I and II.

For ponganone-I, the structures were identified as 7-hydroxy-2', 5'-dimethoxy-3, 4-methylenedioxy-[6", 6"-dimethyl- pyrano (2",3",4',3')] chalcone, and for ponganone II, the structures were described as 7-hydroxy-2', 5'-dimethoxy-3, 4-methylenedioxy-[6", 6"-dimethylpyrano(2", 3": 4', 3')] chalcone. Dalbergia stipulacea root extract 26 has yielded a novel diprenylated chalcone stipulin. For the first time, a novel compound called beta-sitosterol, 3'-methoxyflavone, 3'-dihydroxychalcone, and 3'-hydroxychalcone have been extracted from the whole Primula macrophylla plant. The roots of Tephrosia spinosa 28 were used to extract flemistrictin A chalcones, spinochalcones A and B.

The crude extract of Calythropsis aurea 29 yielded two novel chalcones: calythropsin and dihydrocalythropsin. Two new dihydrochalcones, 2',4, 4', 6'-tetrahydroxy-5-(E-3, 7-dimethylocta-2,

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

6-dienyl)-3-(3-methylbut-2-enyl) dihydrochalcone and 2',4,4',6'- tetrahydroxy-3,5-di(3-methylbut-2-enyl) dihydrochalcone, were isolated and identified from the aerial portions of Boronia inconspicua 30. The ethyl acetate extract of Fissistigma lanuginosum 31 also yielded chalcone pedicin, two more condensed chalcones, fissistin and isofissistin. The aerial portions of Syzygium samarangense 32 were used to isolate a novel triterpene, methyl-3-epi-betulinate in its original form and 4′,6′-dihydroxy-2′-methoxy-3′,5′-dimethyl chalcone.

Munchiwarin, a chalcone with the 2, 2, 6-tri-isoprenyl-cyclohex-5-ene-1, 3-dione skeleton, was isolated from *Crotalaria trifoliastrum* [33]. Flavonoids, syzalterin, L-farrerol and L-liquiritigenin and the chalcone isoliquiritigenin were isolated from fresh flowering bulbs of *Pancratium maritimum* L. [34] α-hydroxydihydro-chalcone (α,4,2′-trihydroxy-4′-O-geranyldihydro-chalcone), a new isoflavone norisojamicin have been isolated from the stem bark of *Millettia usaramensis* [35]. 2', 3'-Dihydroxy-4' 6'-dimethox-chalcone and the corresponding dihydrochalcone were isolated from the leaves of *Uvaria dulcis* [36]. Prorepensin was isolated from the extract of the dried powdered twigs of *Dorstenia prorepens. Dorstenia zenkeri* yielded p-hydroxybenzaldehyde, dorsmaninA,4,2,4-trihydroxychalconeand4,2,4-trihydroxy-3-prenylchalcone[37]. L-hydroxypandu-ratin A, panduratin A, sakuranetin, pinostrobin, pinocembrin and dihydro-5,6-dehydrokawain were isolated from red rhizome variety of *Boesenbergia pandurate* [38].

A new prenylated chalcone Artoindonesianin J isolated fromthe root bark of*Artocarpus bracteata* Hook [39]. Pure lonchocarpin and derricin were isolated from *Lonchocarpus sericeus* Kunth [40]. Xanthoangelol, isobavachalcone, Xanthoangelol H, laserpitin, isolaserpitin, 3'-senecioyl khellacone, 4'-senecioylkhellactone,selinidin,pteryxin,(3'R)-3'-hysroxycolumbianidin, mumdulea flavanone A, prostratol F, falcarindiol and 5- N- penta-decylresorcinol were isolated from the exudate of *Angelica keiskei* [41]. Three sweet dihydrochalcone glucosides tribatin 2"-acetate, phloridzin and trilobatin from the leaves of *Lithocarpus pachyphyllus* (Kurz) [42].

Three novel chalcone derivatives, malloto-philippensC,D,andEwere isolated fromthe fruits of*Mallotusphilippinensis* [43]. Two newchalcone2′, 6′-dihydroxy-4-isopenteniloxy-3, 4-(3″,3″-dimeth- ylpyrano) chalcone and 4,2′,6′-trihydroxy-3′,4′- metilenodioxo-3-isopentenilchalcone were isolated from the wood ethanolic extract of *Beilschmiedia tovarensis* [44]. 2′-hydroxy-4′, 6′-dimethoxy-3, 4-methylenedioxy chalcone was isolated from the leaves of *Bauhinia variegata* [45]. A new flavanone, 7-hydroxy-5,6-dimethoxyflavanone together with three other flavonoids, didymocarpin, 2',4'- dihydroxy-5'6'-dimethoxychalconeand

isodidymocarpin had been isolated from the methanol extract of the tree bark of *Cryptocarya costata*[46].Threenewchalcones,xanthokeisminsA, B and C in addition to a known chalcone, XanthoangelolBfromthestemof*Angelicakeiskei* [47]. Garcinol, the antioxidant chalcone isolated from *Garcinia indica* Choisy [48]. Isocordoin and 2',4'- dihydroxy-3'-(dimethylallyl)-dihydrochalcone were isolated fromtheroot of*Lonchocarpus xuul* [49]. The phytochemical analysis of the plant *Bacopa monnierie* reveals that it contains a chalcone typeofcompound2,4,6-trihydroxy-5-(3,3-dimethyl propenyl)-3-(4-hydroxyphenyl) propiophenone [50]. Two new chalcone derivatives morachalcones B andCwereisolatedfromtheleavesof*Moraalba* L.[51]

Hybrid flavan-chalcones, desmosflavans A and B, together with three known compounds,cardamonin, pinocembrin and crysin were isolated from leaves of *Desmos cochinchinensis* [52]. Eight chalcone derivatives as the active principles, including licochalcone G, licochalcone A, echinantin, 5-prenylbutein, licochalcone D, isoliquiritigenin, licoagrochalcone A and kanzonol C from the *Glycyrrhiza inflata* [53]. Two new chalcone

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

glycosides 4'-O-(6"-O-galloyl-β-d-glucopyranosyl)- 2',4-dihydroxychalcone and 4'-O- (6"-O-galloyl-β-d-glucopyranosyl)- 2'-hydroxy-4- methoxychalcone together with one known chalcone glycoside 4'-O-β-d-glucopyranosyl- 2'- hydroxy-4-methoxychalconewereisolatedfromthe stems of *Entada phaseoloides* [54]. A new flavanone (mildbone) and a new chalcone (mildbenone) have been obtained from African Erythrina species, *Erythrina mildbraedii* of Cameroon [55].

Four flavonoids were obtained and their structures were identified as 3- hydroxy- 4-methoxylon- chocarpin a new prenylated chalcone, 4- methoxylonchocarpin, isobavachromene and dorspoinsettifolin were isolated from the seeds of *Millettia pachycarpa* [56]. A new acetylated chalcone glycoside, trans-2' 6'-dihydroxy- 4'- O-(4"-acetyl- rhamnoside)-4- methoxychalcone and a new biflavonoidglycosides,5,3',5",4"'-tetrahydroxy-3"', 5"'dimethpxy- biflavone (4'→8")- 7- O- ((2-rhamnoside) rhamnoside) were isolated from the ethyl acetate soluble fraction of the methanol extract obtained from *Trigonosciadium brachytaenium* [57].

Three new chalcone dimers oxyfadichacones A, B and C along with four known chalcones, 2',4'-dihydroxychalcone, 2',4',4-trihydroxychalcone, 2'- hydroxy-4'-methoxychalcone and 2',4'-dihydroxy- 4-methoxychalcone, were yielded and identified from *Oxytropis falcata* [58]. Bractelactone, a novel chalcone from *Fissistigma bacteolatum* [59].

Nardokanshone A, a new type ofsesquieterpenoid- chalcone hybrid isolated from *Nardostachys chinensis* [60]. Two new diprenylated dihydro- chalcones, elastichalcone A1 and elastichalcone B2 were isolated from the leaves of *Artocarpus elasticus* [61]. Three new chalcones, 3, 2'-dihydroxy- 4,3'-dimethoxychalcone-4'-glucoside, 4'-O-(2"'-O-caffeoyl)-2',3',3,4-tetrahydroxychalconeand2',4',3- trihydroxy-3',4-dimethoxychalcone were isolated from *Coreopsis lanceolate* flowers [62].

Chalcone dimers Lophirone B and C compounds were isolated from *Lophira alata* [63]. A new prenylated chalcone xanthohumol-M, bichalcone humulusol and six known chalcones were found from *Humulus lupulus* [64]. Bis-dihydrochalcone diglucoside containing a cyclobutene ring, a methylene-bridged bischalconeglycoside, both probablydimersoftheco-occuringisosalipur-

poside, and seven known naringenin, apigenin, kaempferol and luteoline glucoside identified and isolated from extract of the air-dried aerial parts of *Helicrysum zivojinii* [65]. Cardamonin, a schistoso- micidal chalcone from *Piper aduncum* L. (Piperaceae) that inhibits *Schistosoma mansoni* ATP diphosphohydrolase [66].

Six new flavonoids *2′*,4′-dihydroxychalcone-6′-O- β-D-glucopyranoside, α, 3, 2′, 4′-tetrahydroxy-4- methoxy-dihydrochalcone-3′, -C-β-glucopyranosy- 6′- O- β- D-glucopyranoside, 7- hydroxy- 5, 8′- dimethoxy-6′α-L-rhamnopyranosyl-8-(3-phenyl- trans-acryloyl)-1-benzopyran-2-one,6′,7-dihydroxy-5,8-dimethoxy-8(3-phenyl-trans-acryloyl)- 1- benzopyran- 2- one, 9- hydroxy-3, 8- dimethoxy- 4- prenylpterocarpan and α, 4, 4′-trihydroxydihydrochalcone-2′-O-β-D-glucopyrano- side were isolated from bark of *Eysenhardtia polystachya*[67].Twochalcones,sappanchalconean d 3-deoxysappanchalcone were isolated from the ethanolic extract obtained from *Haematoxylum campechianum* L. [68] Two chalcone derivatives isolated from Finger root with nutraceutical potentials [69]. Flavokawain B, pinostrobin and pashanone chalcones were isolated from seeds of *Persicaria lapathifolia* [70].

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

TABLE1:LISTOFCHALCONESFROMMEDICINALPLANTS

MedicinalPlantname	Chalcone	Referenceno.
Dydimocarpusaurentica	AurentiacinAandAurentiacinB	Adhityachaudhury[12], 1976
Pityrogrammatriangularis	Triangularin-2′,6′-dihydroxy-4′-methoxy-3′-methylchalcone	Star [13]1978
Myricagale	2′,6′-dihydroxy-4′-methoxy-3′,5′-dimethyldihydrochalcone	Uyar [14],1978
Derrisrobusta	Rubone	Chibber[15],1979
Psoraleacorylifolia	*Bakuchalcone*	Suri[16],1980
Polygonumlapathifolium	dihydrochalconeandthreechalconederivatives lapathinol, lapathone	Ahmad[17],1981
Brackenridgeazanguebarica	Brackenin	Drewes[18],1983
Tephrosiawoodii	Mixtecacin	Dominguez[19],1983
Helichrysumrugulosum	Mixture of 1,3,4- trimethoxy derivatives and dimethylallylgroupsandmethoxyderivatives chalcone	Bohlmann[20],1984
Linderaumbellate	2′,6′-dihydroxy-4′-methoxydihydrochalconeand 2,4′,6′-trihydroxydihydrochalcone	Tanaka[21],1984
Glycyrrhizaeradix	IsoliquiritinandLicuraside	Aida[22],1990
Angelicakeiskei	XanthangelolsB-E	Baba [23],1990
Bidenstripartitus	2'-hydroxy-4,4'-dimethoxychalcone	Christensen[24],1990
Pongamiapinnata	PonganonesIandII	Tanaka[25],1991
Dalbergiastipulacea	Stipulin	Bhatt[26],1992
Primulamacrophylla	3,3'-dihydroxychalcone	Ahmad[27],1992
Tephrosiaspinosa	SpinochalconesAandB,flemistrictinA	VenkataRao[28], 1992
Calythropsisaurea	Calythropsinanddihydrocalythropsin	Beutler[29],1993
Boroniainconspicua	2',4,4',6'-tetrahydroxy-5-(E-3,7-dimethylocta-2,6-dienyl)-3-(3-methylbut-2-enyl) dihydrochalcone and2',4,4',6'-tetrahydroxy-3,5-di(3-methylbut-2-enyl) dihydrochalcone	Ahsan[30], 1994
Fissistigma lanuginosum	Pedicin, fissistin and isofissistin	Alias [31], 1995
Syzygium samarangense	4′,6′-dihydroxy-2′-methoxy-3′,5′-dimethyl chalcone	Srivastava[32],1995
Crotalaria trifoliastrum	Munchiwarin	Yang [33], 1998
*Pancratiummaritimum*L.	Isoliquiritigenin	Youssef[34], 1998
Millettiausaramensis	α,4,2′-trihydroxy-4′-O-geranyldihydrochalcone	Yenesew[35],1998
Uvariadulcis	2',3'-Dihydroxy-4'6'-dimethoxchalcone	Chantrapromma[36],2000
Dorsteniaprorepens Dorstenia zenkeri	Prorepensin	
	p-hydroxybenzaldehyde,dorsmaninA,4,2,4- trihydroxychalcone and 4,2,4-trihydroxy-3- prenylchalcone	
	Abegaz[37],2002	
	Abegaz[37],2002	
Boesenbergiapandurate	L-hydroxypanduratinA,panduratinA,sakuranetin, pinostrobin,pinocembrinanddihydro-5,6- dehydrokawain	
	Tuchinda[38],2002	
Artocarpusbracteata	ArtoindonesianinJ	Ersam[39],2002
Lonchocarpussericeus	Lonchocarpinandderricin	AndradeCunha[40], 2003
Angelicakeiskei	Xanthoangelol,isobavachalcone,XanthoangelolH, laserpitin,isolaserpitin,3'-senecioylkhellacone,4'- senecioyl khellactone, selinidin	
Lithocarpuspachyphyllus	Threesweetdihydrochalconeglucosidestribatin2"-acetate,phloridzinandtrilobatin	
	Akihisa[41],2003	
	Yang[42],2004	
Mallotusphilippinensis	MallotophilippensC, DandE	Daikonya[43],2004
Beilschmiediatovarensis	2′,6′-dihydroxy-4-isopenteniloxy-3,4-(3″,3″-	

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

	dimethylpyrano)chalconeand4,2′,6′-trihydroxy- 3′,4′-metilenodioxo-3-isopentenilchalcone	
Bauhiniavariegate	2′-hydroxy-4′,6′-dimethoxy-3,4-methylenedioxy chalcone	
	Suarez[44], 2005	
	Maheswara[45],2006	
Cryptocaryacostata	2',4'-dihydroxy-5'6'-dimethoxychalcone	Usman[46],2006
Angelicakeiskei	XanthokeisminsA,BandC	Aoki[47],2008
*Garciniaindica*Choisy	Garcinol	Panhey[48],2009
Lonchocarpusxuul	Isocordoinand2',4'-dihydroxy-3'-(dimethylallyl)-dihydrochalcone	
Bacopamonnierie	2,4,6-trihydroxy-5-(3,3-dimethylpropenyl)-3-(4-hydroxyphenyl)propiophenone	
	Borges-Argaez[49],2009	
	Suresh[50],2010	
*Moraalba*L.	MorachalconesBandC	Yang[51],2010
Desmoscochinchinensis	DesmosflavansAandB	Bajgai [52],2011

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

Glycyrrhizainflata	LicochalconeG,licochalconeA,echinantin,5-prenylbutein,licochalconeD,isoliquiritigenin, licoagrochalcone A and kanzonol C	
Entadaphaseoloides	4'-O-(6"-O-galloyl-β-d-glucopyranosyl)-2',4-dihydroxychalcone, 4'-O-(6"-O-galloyl-β-d- glucopyranosyl)-2'-hydroxy-4-methoxychalcone and 4'-O-β-d-glucopyranosyl-2'-hydroxy-4- methoxychalcone	
	Dao[53],2011	
	Zhao[54],2011	
Erythrinamildbraedii	Mildbenone	Ali[55],2012
Millettiapachycarpa	4-methoxylonchocarpin,isobavachromeneand dorspoinsettifolin	
Trigonosciadiumbrachytaenium	Trans-2'6'-dihydroxy-4'-O-(4"-acetyl-rhamnoside)-4-methoxychalcone	
Oxytropisfalcata	2',4'-dihydroxychalcone,2',4',4-trihydroxychalcone, 2'-hydroxy-4'-methoxychalconeand2',4'- dihydroxy-4-methoxychalcone	
	Su[56],2012	
	Akhavan[57],2013	
	Zhang[58],2013	
Fissistigmabacteolatum	Bractelactone	Wu[59],2013
Nardostachyschinensis	NardokanshoneADiprenylated	Wang[60],2013
Artocarpus elasticus	dihydrochalcones,ElastichalconeA1and Elastichalcone B2	
Coreopsis lanceolate	3,2'-dihydroxy-4,3'-dimethoxychalcone-4'- glucoside, 4'-O-(2'"-O-caffeoyl)-2',3',3,4-Ramli[61],2013Shang[62],2013	
	tetrahydroxychalconeand2',4',3-trihydroxy-3',4-dimethoxychalcone	
Lophiraalata	LophironeBandC	Ajiboye[63], 2014
Humuluslupulus	Xanthohumol-M,bichalconehumulusolandsix known chalcones	Yu[64],2014
Helicrysumzivojinii	Bis-dihydrochalcone	Aljancic[65],2014
*Piperaduncum*L.	Cardamonin	Castro[66],2015
Eysenhardtiapolystachya	*2′*,4′-dihydroxychalcone-6′-O-β-D-glucopyranoside, α,3,2′,4′-tetrahydroxy-4-methoxy-dihydrochalcone-3′,-C-β-glucopyranosy-6′-O-β-D-glucopyranoside and α,4,4′-trihydroxydihydrochalcone-2′-O-β-D-glucopyranoside	Perez-Gutierrez[67],2016
*Haematoxylumcampechianum*L.	Sappanchalconeand3-deoxysappanchalcone	Escobar-Ramos[68],2017
Fingerroot	Twochalconederivatives	Brahimawad[69],2018
Persicarialapathifolia	FlavokawainB,pinostrobinandpashanone chalcones	Hailemariam[70],2018

Importance of Chalcones: The pharmacophore of chalcones is intriguing because it can be used as a building block to make various five- and six-membered heterocyclic compounds, including pyrimidines, pyrazolines, flavones, flavonols, flavonones, aurons, and benzoylcoumarones. It can also be used to make compounds with medicinal potential, such as deoxybenzoins and hydantoins. Chalcones and their derivatives have a wide range of uses, including artificial sweeteners, scintillators, catalysts for polymerization, whitening agents (both fluorescent and organic), stabilizers against heat, visible light, ultraviolet light, and aging, and 8 more. Traditional medicine has also made extensive use of herbs that contain chalcone. All throughout the globe, people are turning to herbal remedies in ever increasing numbers. Clinical trials for the treatment of cancer, viral and cardiovascular illnesses, and as ingredients in cosmetic preparations have been authorized as a consequence of pharmacological investigations using various pure chalcones isolated from various plants 72, 73. In the foods we eat on a regular basis, polyphenols are among the most common types of chemicals. Because of their

INTERNATIONAL JOURNAL OF PURE AND APPLIED SCIENCE & TECHNOLOGY
IJPAST
ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

intriguing biological activity, chalcones have garnered a lot of research in the last decade. The chalcones are a class of naturally occurring chemicals that have a long history of use in traditional herbal medicine. They are abundant in many different foods, including fruits (citruses, apples), vegetables (tomatoes, shallots, bean sprouts, potatoes), and herbs (licorice, for example). The production of 4,2′,4′,6′-tetrahydroxychalcone, or naringenin chalcone, by chalcone synthase accounts for the vast bulk of chalcone content in citrus fruits and other plants. An important component of the flavonoid biosynthesis pathway, naringenin chalcone accounts for a significant portion of the total flavonoids found in plants.

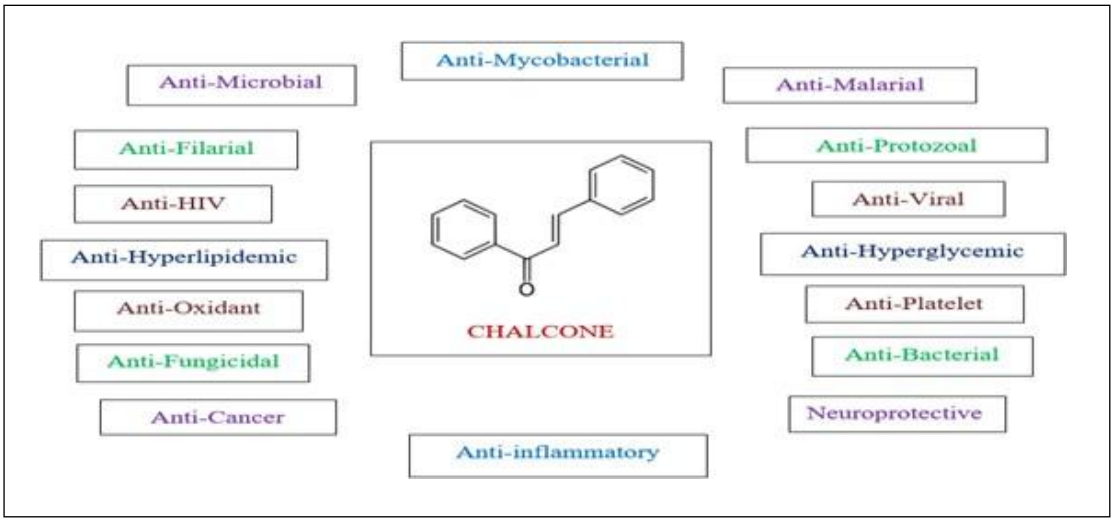


FIG.3:PHARMACOLOGICALACTIVITIESOFCHALCONE

Pharmacological Activities of Chalcones: The biological effects of chalcones were found to be dependentonthepresence,thenumberandposition of functional groups such as methoxy, glycosides, hydroxyl, halogens in both A and B rings [75]. They present a broad spectrum of biological activities such as antifungal [76], antifilarial, larvicidal, anticonvulsant[66],anticancer[77,78],anti-inflammatory[79],neuroprotective[79],antimalarial[80], antibacterial[81],antilipidemic[82],antihyperglycemic [82],antiviral [83], antimycobacterial [84], antiprotozoal (antileishmanial and antitrypanosoma) [85], antiangiogenic [86], antiplatelet [87], anti-HIV [88] and Two chalconoids from the desert plant *Pulicaria incisa* prevented cell death by inhibiting reactive oxygen species (ROS) [89]. The chalcones showed selective, reversible and potent MAO-B inhibition compared to MAO-A. Recent studies also showed that heteroaryl-based chalcones are potent MAO-A inhibitors [90].

CONCLUSION: Natural goods made from plants, in particular, often include chalcones as a scaffold. Additionally, chalcone derivatives are generated in large quantities since they are simple to synthesize. Because of their many intriguing biological activities and therapeutic potential against a wide range of disorders, chalcone derivatives, both natural and synthetic, are considered a privileged structure of enormous practical importance. Chalcones have piqued the curiosity of researchers in a wide range of fields 91.

REFERENCES:

1. 1. CW Phan, Sabaratnam V, Yong WK, and SN Abd Malek: Influence of chalcones on PC12 ADH cell neurite outgrowth: helichrysetin, xanthohumol, and flavokawin-C. The article "Nat Prod Res 2018; 32(10): 1229-33" refers to the publication year of 2018.
2. 2. The use of chalcones derivatives as effective inhibitors of cell division cycle 25B phosphatase was reported by Zhang J, Ji FJ, Gu Y, Zhang XY, and Qiao SX. Pharmaceutical Reports, 2014, 66(3), 515–509.
3. Rozmer Z and Perjesi P: Biological activity of naturally occurring chalcones. Volume 15, Issue 1, Pages 87–120, Phyto 2016 in press.
4.

ISSN 2229-6107 www.ijpast.in
Vol 12,Issuse 1.March 2022

5. 4. Past and present trends in chalcone pharmacological potential exploitation (Batovska DI and Todorova IT). The article is published in the Current Clinical Pharmacology journal and the page count is 1,29.
6. 5. An Overview of Flavonoids by Panche, Diwan, and Chandra. The article is published in the Journal of Nutritional Sciences in 2016 and can be found on page 1–15.
7. 6. Recent advancements in the medicinal uses of chalcones, by Katsori AM and Litina HD. Therapeutic Patents: An Expert Opinion, 2011; 21(10): 1575–96.
8. 7. Mahu NK, Balbhadra SS, Choudary J, and Kohli DV: A review of the chalcone scaffold's pharmacological importance. Article published in 2012 in the journal Current Medical Chemistry, volume 19, issue 2, pages 209–25.
9. 8. A Review on Chalcones and Their Importance by Erragunta V, Kumaraswamy T, Suman D, Anusha V, Patil P, and Samhitha T- Pharma Journal of Tutoring, 2013; 1(2): 54-9.
10. 9. A review of the synthesis and pharmacological importance of chalcones by Chavan BB, Gadekar AS, Mehta PP, Vawhal PK, Kolsure AK, and Chabukswar AR. January–March 2016; 6(56): 01–07 in the Asian Journal of Biomedical and Pharmaceutical Sciences.
11. 10. Synthesis and characterisation of certain chalcone derivatives by Shahilendra M, Hemendra PS, Dutta SG, and Moorthy NSHN. Published in 2007 in Volume 2, Issue 1, Pages 52–56.
12. 11. Diaz-Tielas C, Grana E, Reigosa MJ and Moreiras SAM: Chalcones: an exploration of their biological activity and potential new uses. Adityachaudhhury N, Das AK, Choudhaury A, and Daskanungo PL: Aurentiacin, a novel chalcone from Dydimocarpus aurentiaca. Planta Daninha 2016; 34(3): 607-16. 12. Phytochemistry, 1976, 15, 229–230.
13. 13. Triangularin, a novel chalcone derived from P. triangularis, was published by Star AE, Mabry TJ, and Smith DM. Phytoche, 1978, 17, 586–587. As cited in the journal.
14. Uyar, Malterud, and Anthonsen (2014) identified two novel dihydrochalcones in Myrica gale. Chibber SS, Sharma RP, and Dutt SK: Rubone, a novel chalcone from Derris robusta seed shells. Phytochemistry 1978; 17: 2011-13. In 1979, the journal Phytochemistry published an article with the DOI number 18: 2056.