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STUDY ON COMPRESSIVE STRENGTH OF CEMENT MORTAR WITH NATURAL ADMIXTURE

Ranjani.G[1], Thirumal Murugan.G[2]

[1]*Under-Graduation Students, Department of Civil Engineering, Periyar Maniammai Institute of Science and Technology, Vallam, Thanjavur, Tamil Nadu, India*

[2]*Assistant Professor, Department of Civil Engineering, Periyar Maniammai Institute of Science and Technology, Vallam, Thanjavur, Tamil Nadu, India*

ABSTRACT: ***Cement is used as the major construction material. Now a day various chemical admixture is used as to rise the strength of concrete of concrete. used cement,chemicals in latest construction occasion environmental pollution and effect it. Ourselves by shifting some ecosystem friendly(natural admixtures in mortar will lead the construction industry towards sustainable evolution. So, in this experiment in effort to increase the compressive strength of the mortar by added natural admixture are "Terminalia Chebula" i.e., {kadukkai} and Jaggery. The natural admixtures were prepared at concentration of 2.5 in 1000ml water. The various proportions of admixture are added by weight of cement and tests are carried to find the compressive strength. While added 10 Percent of admixture gives the better results as collate to the normal (conventional) mortar.***

Keyword: Kadukkai, Jaggery

I. INTRODUCTION:

Cement is the major binding material in construction .Now-a-days different type chemicals are used as admixture to the concrete for rise the strength. Some chemicals admixture used in latest construction it causes heavy pollution in environment also So, in this is effort is made to rise the strength parameters of the cement mortar by using natural admixtures. The natural admixtures are "Terminalia chebula" and "jaggery" that can helps to improve strength. In various experimental flexural strength and compressive strength increased by use of Terminaliachebula [1]. Compressive strength of concrete enhanced admixture was increased based upon dosage. Concrete with Jaggery as admixture it give high strength compare to sugar. Segregation and bleeding was less due to the usage of natural admixture[2].10% of natural admixture added in lime-cement mortar its give the medium level of compressive strength compared to the normal (conventional) mortar. In future reducing the amount of natural admixtures below 10%, may increase the strength of lime-cement mortar[3]. 25, 50, 75 and 100 % of jaggery water with lime and cement mortar and 10% of kadukka powder is taken account. In experimental investigation the following suggestions are made for the efficient use jaggery water 75% is optimum without any modification since there is no cutting in target mean strength[4].

Addition of kadukkai increases the workability by 10%. The present experimental reveals that the addition of natural admixtures to the mortar will rise its strength. results shows that the maximum compressive strength for cement mortar is achieved with 5% of Kadukkai and Jaggery solution of water for 28 days is 27.5 N/mm2. The compressive strength is increased by about 1.31 times of reference mortar for 28days fermentation of 5% of Terminalia chebula extract and Jaggery extract. The natural admixtures are environmentally friendly and they treated like pollution free admixture then compared to chemical admixture[5]. the added of natural admixtures to the lime mortar will be rise its compressive strength. The maximum compressive strength of lime mortar obtained at 10% of jaggery at 28 days is found to be 3.71 N/mm2 and 2.34 N/mm2 for 10% of Kadukkai. The optimum percentage of both kadukkai and jaggery which gives high compressive strength is 2.5%[6]. Utilisation of waste food grain causing environmental problems in concrete as admixture in place of chemical admixtures. Research shall discourage using chemical admixtures in concrete as they are accoumtable for environmental causes[7].

II.MATERIAL USED:

Fig 1:kaddukkai

Fig2: Jaggery solution

Cement:

OBC 43 grade

Recycled aggregate:

Demolition waste is generated during construction renovation and demolition of building and brick waste is used as aggregate (fine) in the production of mortar cube. It gives specific gravity of 1.63

Terminalia chebula:

This is a natural product easily available and not expensive it is also used for medical purpose.This herbal product rise the strength of mortar.

Jaggery:

This is a natural product of sugarcane it is a edible productit is used in mortar cube it will be increasing the setting time and strength of the mortar cube.

Methodology:

- Collection of material that is cement,sand,recycled brickbat waste ,natural admixture natural admixture were fermented for 1 day
- Cast the cube based on mix propotion
- Curing for 7 , 14 and 21 days
- Finally water absorption and compression test
- Results are taken

Preparation of natural admixture:

- First , 25g of jaggery is added in 1000ml of water and it is fermented for 1 day.
- Similar procedure is followed for preparation of kadukkai solution also.
- Both jaggery and kadukkai(25g) is taken and 1 litre of water is added and fermented for 1 day.

III.RESULTS AND DISCUSSION:

Table 1 :- water absorption test

Si.no	Specimen details	Result
1	cement and sand	12.36
2	cement and brickbat	18.93
3	cement and brickbat (kadukkai)	17.55
4	cement and brickbat(jaggery)	12.2
5	cement and brickbat(jaggery + kadukkai)	12.6

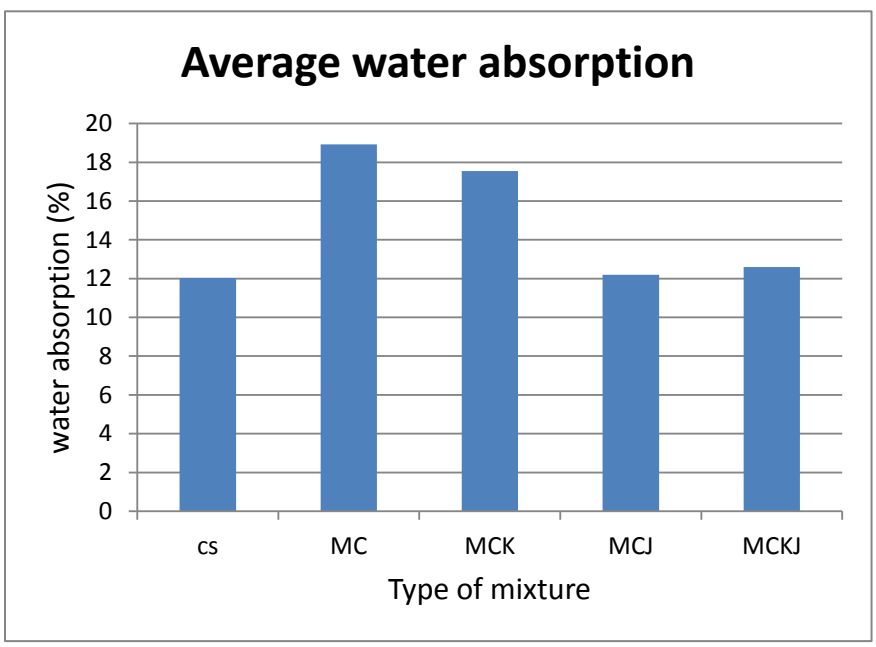

fig 3 :water absorption

Table 2 :- compressive test

Si.no	Specimen details	7days	14days	28days
1	cement and sand	11	16.75	17
2	cement and brickbat	16	16.5	16.9
3	cement and brickbat (kadukkai)	11.5	19	19.5
4	cement and brickbat(jaggery)	12	16.5	17.5
5	cement and brickbat(jaggery + kadukkai)	21	24.5	25.5

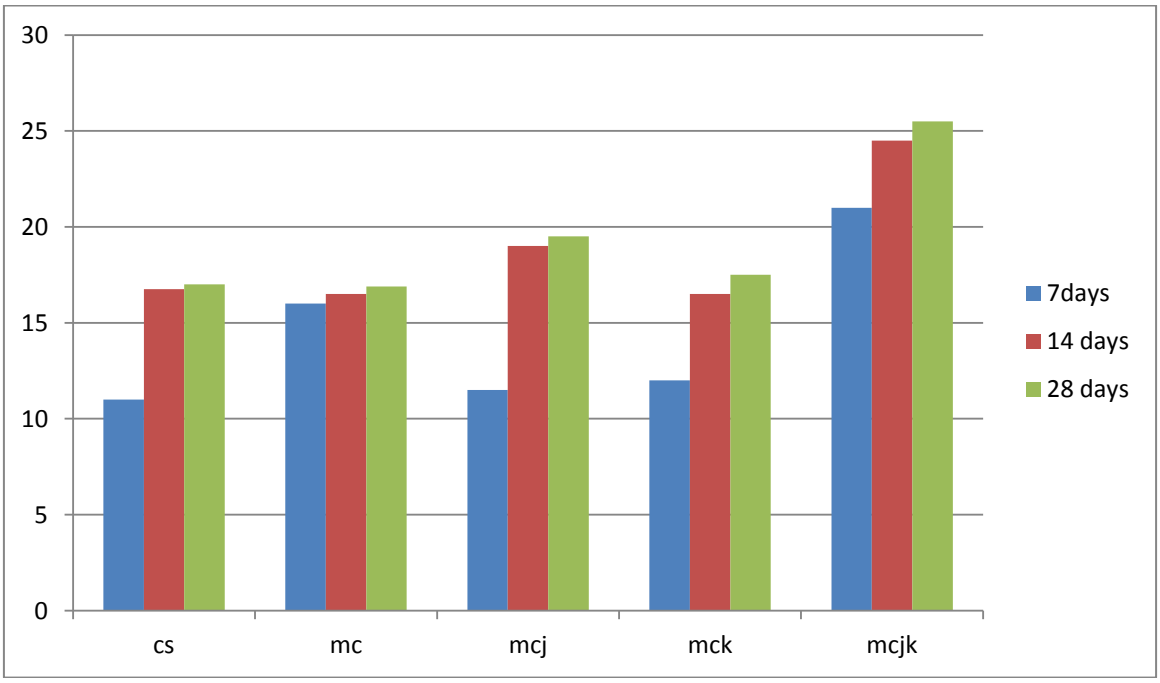

Fig 4 Compressive test

IV.CONCLUSION

On the basis oof results produced in this study it is concluded that, Addition of kadukkai and jaggery increases the workability by 10%. The present experimental reveals the addition of natural admixture to the cement mortar will rise its compressive strength. The results shows that the compressive strength for cement mortar maximum is achieved with 25% of Kadukkai and Jaggery solution of water at 21 days is 25.5N/mm2. The compressive strength is increased by about 1.31 times of mention to mortar for 28days fermentation of 5% of Terminalia chebula extract and Jaggery extract.The natural admixtures are environmentally friendly and they treated like pollution free admixture then compared to chemical admixture.it is use for control the temperature

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