The stable isotopic compositions in event precipitation and characteristics the isotopic composition in case of typhoon

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It is important to make clear the stable isotopic compositions of oxygen and hydrogen in event precipitation when consider the soil water movement by using these values as a tracer.And the soil water movement is influenced by the typhoon is estimated,therefore also important to analysis the isotppic compositions of typhoon samples.

The precipitation samples are took at every event precipitation from January,2000,and typhoon 11(from August 21 to 22,2001)and typhoon 15(from September 10 to 11,2001)in every one hour on the University of Tsukub.All samples were measured the stable isotopic compositions of oxygen and hydrogen by mass spectrometer(Finnigan MAT 252).

The results of isotopic compositions of event precipitations,in January,2001 are isotopically lighter than January,2000.In 2001,there is snowfall in some days,thus it is presumed that the isotopic compositions were affected by the snowfall.In rainy season(early summer period in Japan)in 2001,the isotopic composition of precipitation is isotopically lighter than that of other season.And there is a trend when the precipitation amount is large,the isotopic compositions are isotopically lighter,from this result,the isotopic amount effect is confirmed in Tsukuba precipitation.D-parameter of precipitation is relatively high value in winter season.These trend also observed in other years and other places in Japan.From December to March,the strong isotopic compositions-temperature relationship is observed.

From the time series variations of dD in Typhoon 11 and 15(Figs.1 and 2),it indicate that the dD values became isotopically light suddenly near the peak of precipitation amount,but after that the dD values became isotopically heavy.The relationship between precipitation amount and dD values of each typhoon samples are shown in Figs.3 and 4.In these figures,some part is confirmed the isotopic amount effect,though it is need more consideration.The relationship of d18O and dD values and both regression line of typhoon 11 and 15 are shown in the Fig.5 and Fig.6,respectively.The slope is about 8.2,and y-intercept are 8.7 and 9.0.Furthermore,weighted mean isotopic values of typhoon samples plotted near the local meteoric water line in Tsukuba.That may be one of the characteristic of typhoon.

In conclusion,we have measured the stable isotopic compositions of precipitation,and found the typhoon samples are isotopically lighter,it is presumed that using these values as tracer to consider the soil water movement is available.

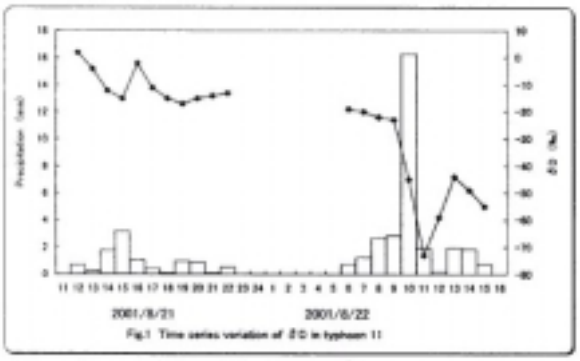

Fig.1 Time series variation of δD in typhoon 11

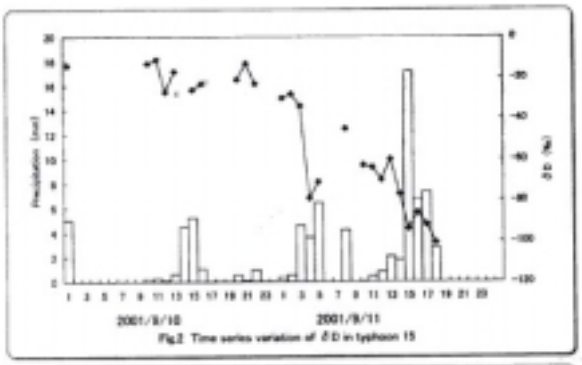

Fig.2 Time series variation of δD in typhoon 15

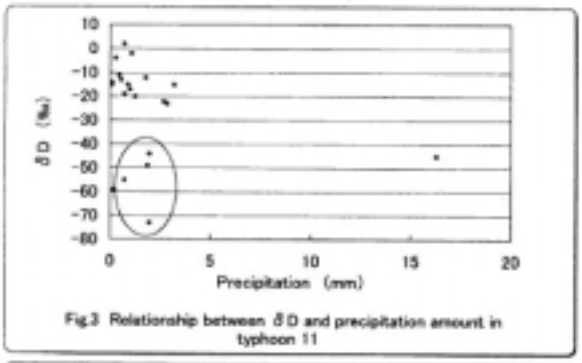

Fig.3 Relationship between δD and precipitation amount in typhoon 11

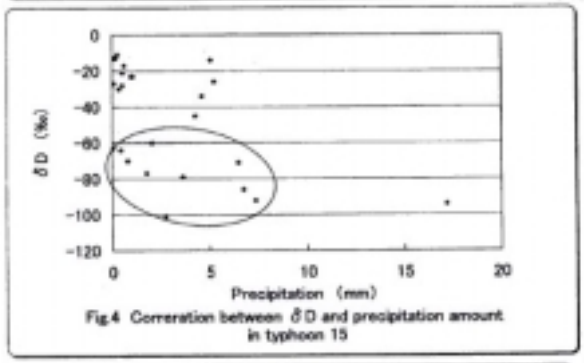

Fig.4 Correration between δD and precipitation amount in typhoon 15

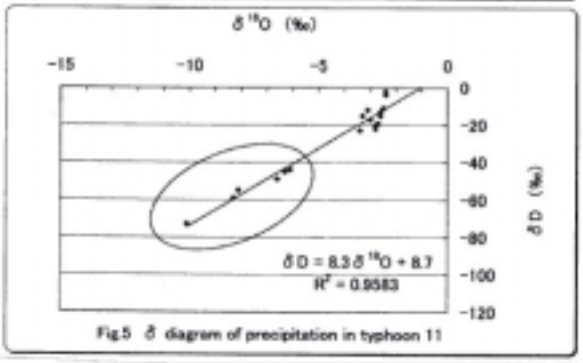

Fig.5 δ diagram of precipitation in typhoon 11

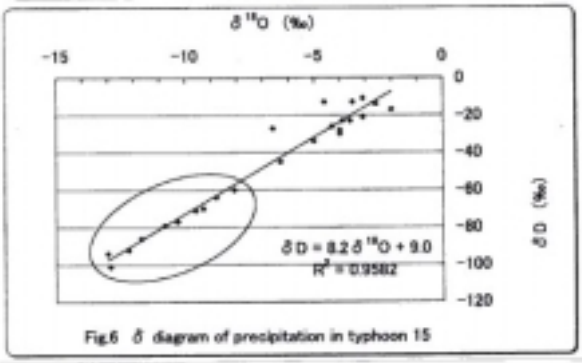

Fig.6 δ diagram of precipitation in typhoon 15